June 19, 1939

# TEEL

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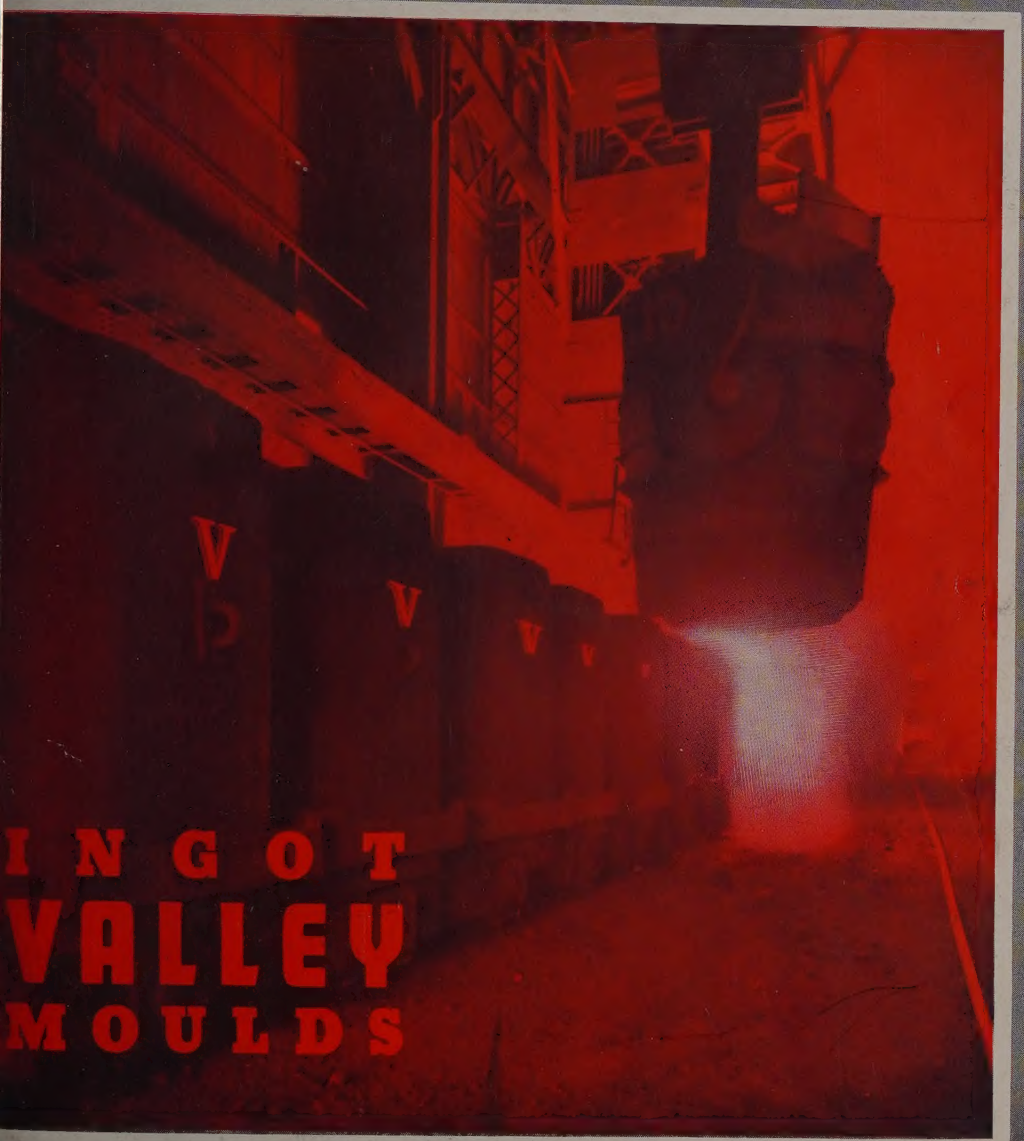


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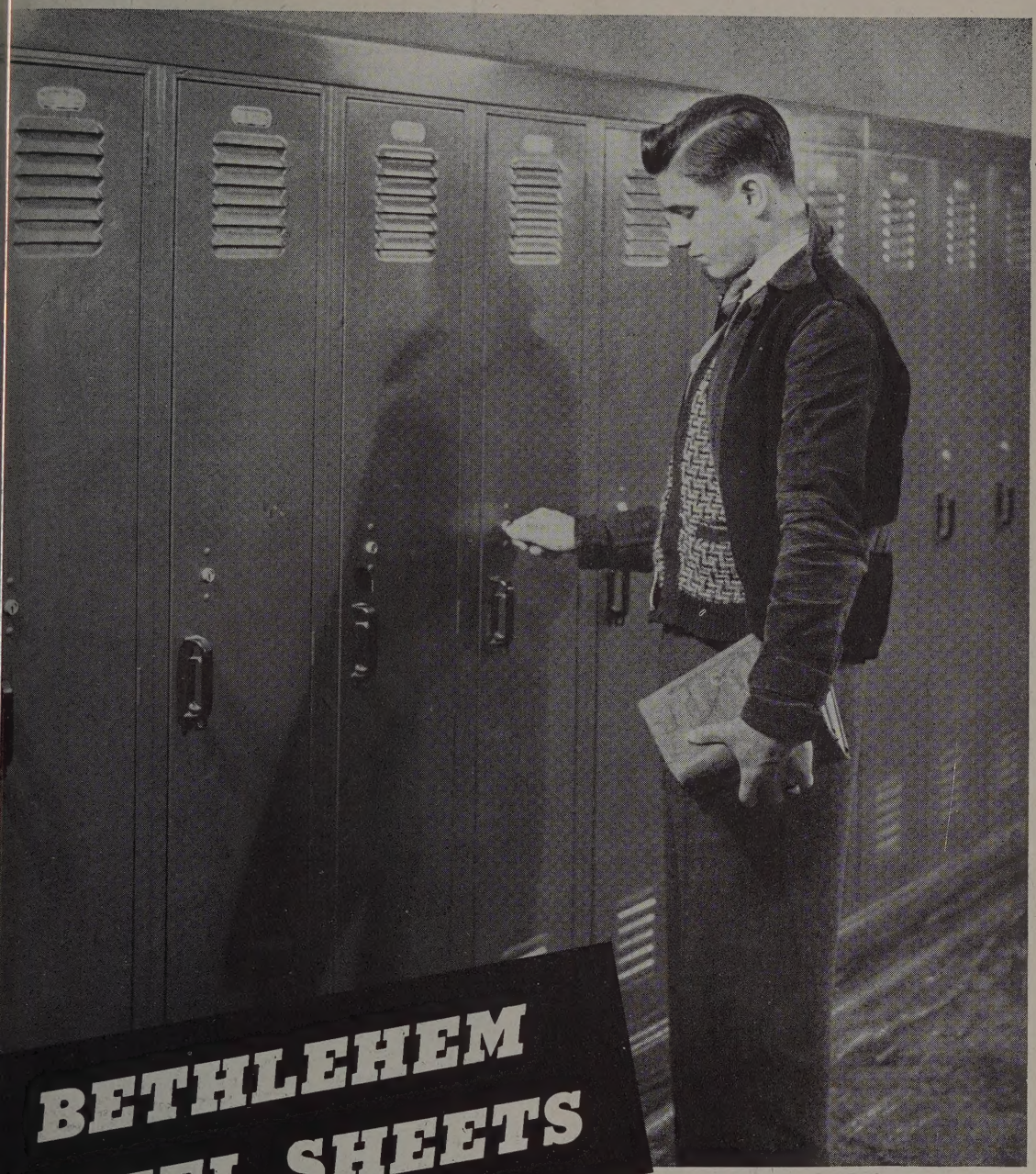

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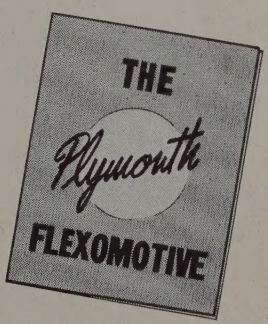


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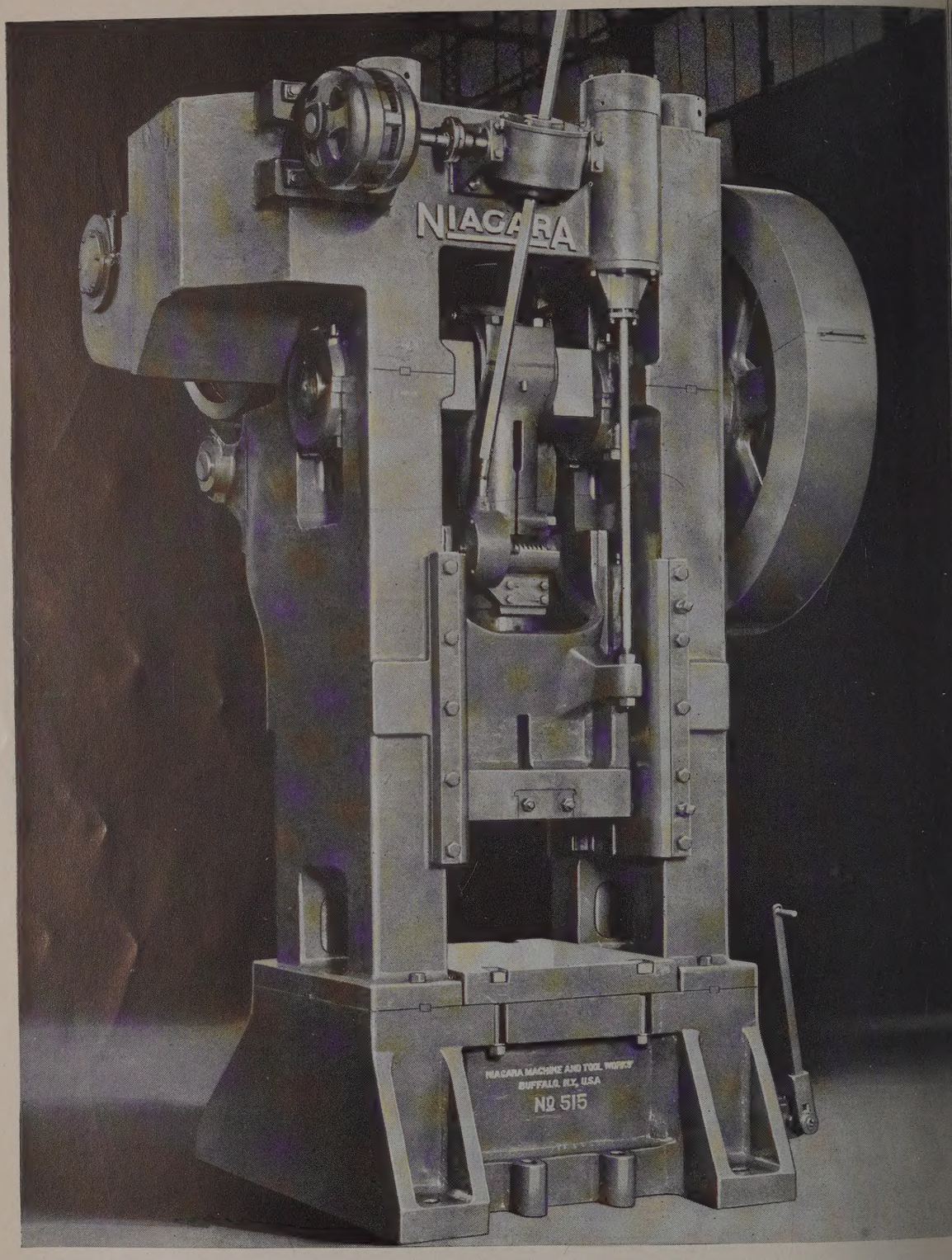


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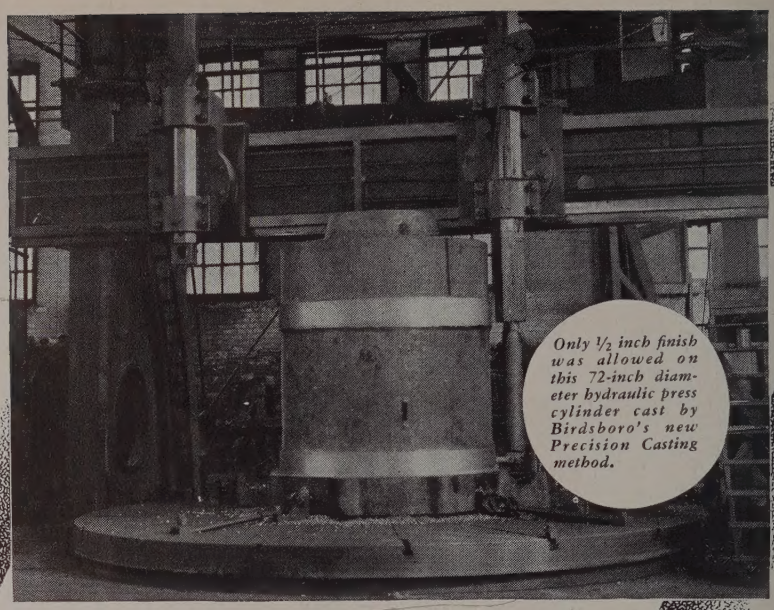

*Only ½ inch finish was allowed on this 72-inch diameter hydraulic press cylinder cast by Birdsboro's new Precision Casting method.*

# NEW PRECISION CASTINGS *Cut* MACHIN AND FINISHING COSTS

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To give you quickly essential information on the design, production and sales advantages you may expect from precision castings, we have prepared literature describing and illustrating current experience. May we send it to you?

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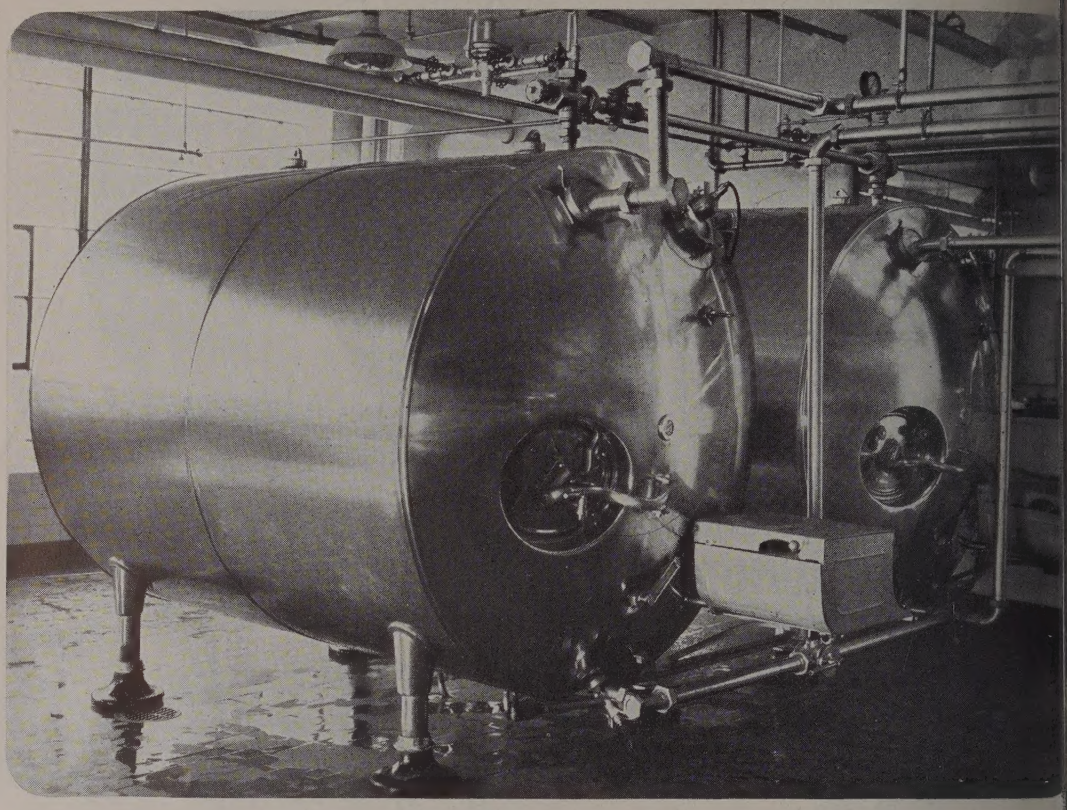

# TALE OF *Two Tanks..*

• These twin prefil tanks for milk products are a good pictorial story of the uniform drawing and welding qualities of Armco Stainless Steels . . . Smooth, rounded lines and clean, sound welds. Any fabricator might well be proud of their handsome, efficient design.

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Just let us know what you make or intend make. Chances are we can help pool Armco Sta less Steel with your fabricating experience — ward definite shop savings and more saleab products. Your letter will be given prompt, i dividual attention. The American Rolling M Company, 1290 Curtis Street, Middletown, Oh

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# ELDED PIPE JOINTS IN LESS TIME
## ith CRANE'S new socket welding fittings

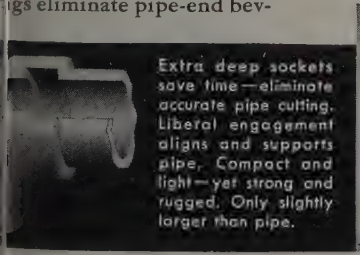
MICAL to use—because installed with greater peed—these new Crane fit- small lines permit wider of welded piping. Crane ding Fittings are not made ary screwed fittings blanks *ngineered* for welding, of el—for more efficient and vice.

ne design of these fittings cket welded joints more r small lines. Not only do gs eliminate pipe-end bev- eling and prevent the danger of welding icicles obstructing the flow, but now, pipe need not be cut to accurate length—or even square.

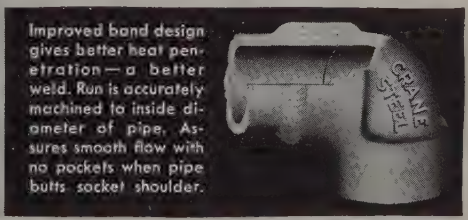
Crane design eliminates the heavy end bands that prevent uniform heat penetration in ordinary fittings. Conforming to advanced welding technique, electric arc or gas, Crane fittings provide a superior weld—with less metal, and in less time. The joint is stronger than the pipe itself. The Crane-Quality of these fittings assures faithful performance in any application. The soundness of their design is backed by Crane's 84-year manufacturing experience in serving industry's every piping need.

**Write for Complete Information**

Get all the facts on the greater efficiency and money-saving advantages of these new Crane Socket Welding Fittings. Illustrated Bulletin No. 309 gives full information on tests, sizes, ratings, prices. Mail the coupon today! No obligation.



Extra deep sockets save time—eliminate accurate pipe cutting. Liberal engagement aligns and supports pipe. Compact and light—yet strong and rugged. Only slightly larger than pipe.




Improved band design gives better heat penetration—a better weld. Run is accurately machined to inside diameter of pipe. Assures smooth flow with no pockets when pipe butts socket shoulder.

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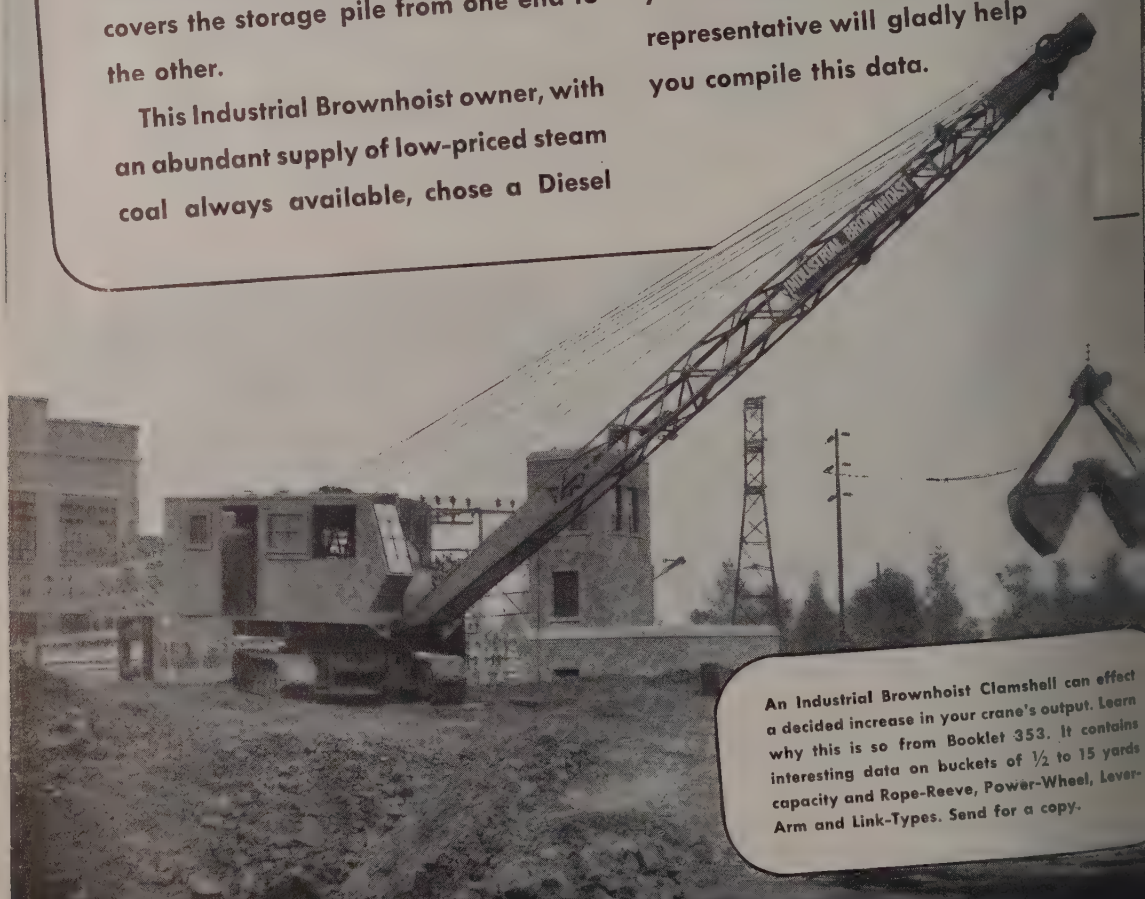
This Industrial Brownhoist owner, with an abundant supply of low-priced steam coal always available, chose a Diesel crawler crane because of its lower operating costs, freedom from smoke nuisance and the fact that the Diesel starts instantly with no lost time for "firing-up" or to take on coal and water.

Would you be interested in knowing what savings could be effected by an Industrial Brownhoist Diesel crane on your handling work? Our nearby sales representative will gladly help you compile this data.




An Industrial Brownhoist Clamshell can effect a decided increase in your crane's output. Learn why this is so from Booklet 353. It contains interesting data on buckets of ½ to 15 yards capacity and Rope-Reeve, Power-Wheel, Lever-Arm and Link-Types. Send for a copy.

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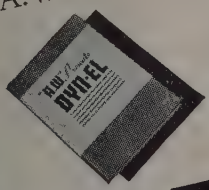


The 48-page book, "A.W." Presents Dyn-el, gives full details of savings in weight and cost possible with this new high-strength, flat-rolled steel. Diagrams, tables and charts cover a wide range of tests and properties. To executives, this book gives a quick picture of performance and costs. To engineers, it gives complete fabricating and design properties and table of sizes and weights. We will be pleased to send you a copy.

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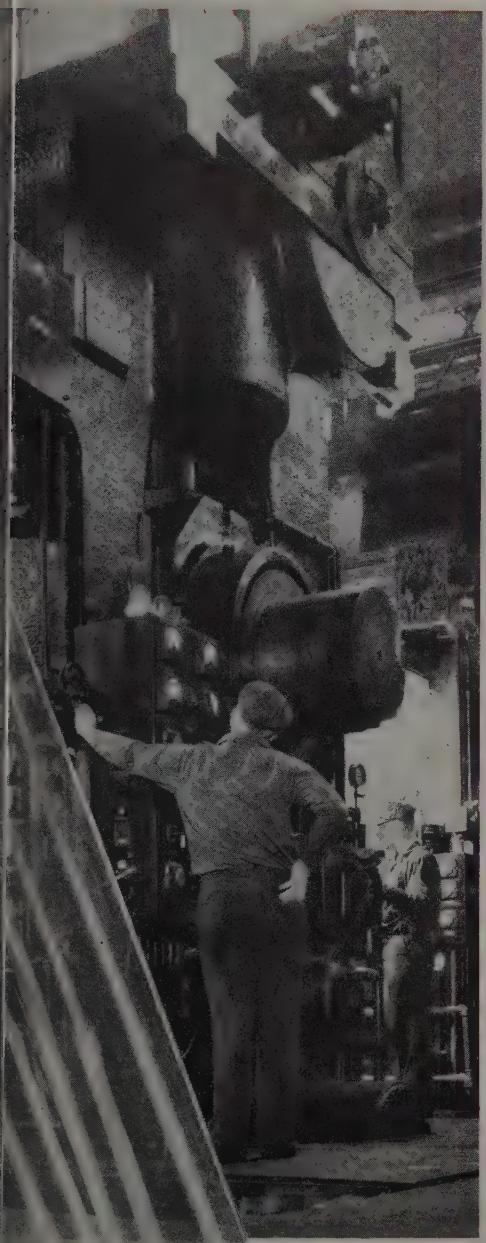

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### Vell Reported

*itor:*

like to express my appre- the very excellent way in staff reported the recent eeting of the Institute. mplete and accurate re- the sessions should have ose who were not present eeting to obtain a well- icture of the proceedings.

WALTER S. TOWER

*Secretary,*
*Iron and Steel Institute,*

### Reprints Available

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June 5 issue you publish ydings' address before the Iron and Steel institute. a masterful address and believes thousands of in- ould like reprints for dis- among their workers and o do not have opportunity ise reading it. nts will be available, quote er thousand.

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*Note*—Reprints of Senator address may be obtained EL at 10 cents each for ies or small lots; 5 cents 100 to 500; 4 cents for 500 cents over 1000.

### Vorker Should Read"

*litor:*

send me under personal copies of the address of Millard E. Tydings before al meeting of the Ameri- can Iron and Steel institute, May 25.

Every worker in this country possessing enough intelligence to read and think should certainly read every word of this address.

C. I. SPROWL

*President,*
*Mapes & Sprowl Steel Co.,*
*Newark, N. J.*

### "Remarkable Speech"

*To the Editor:*

Please send 100 reprints of Senator Tydings' address. May we congratulate STEEL on offering the opportunity to get copies of this remarkable speech.

U. SETH EBERHARDT

*Vice President,*
*Newark Gear Cutting Machine Co.,*
*Newark, N. J.*

### "Very Interesting"

*To the Editor:*

Please send us ten copies of Senator Tydings' address before the annual meeting of the American Iron and Steel institute, contained in the June 5 issue of STEEL. This address was found to be very interesting.

J. R. H. NEAL

*President,*
*Root, Neal & Co.,*
*Buffalo.*

### Export Figures Eloquent

*To the Editor:*

Frequent criticism of American exporters for alleged shortcomings in their methods of selling in foreign markets would seem to be poorly based, in view of the position they have assumed in world trade. Perhaps our salesmen have not learned to conform to buyers' habits in more leisurely countries but it would seem this possible handicap is more than overcome by excellence of what they have to sell.

In STEEL, June 12, page 30, the machinery division of the department of commerce reported sales of farm equipment totaling over $75,000,000 in 1938 and a practically equivalent volume in 1937. The report also stated that gains had been made in most markets in the later year, while losses in some other markets were the result of barter agreements, which are outside the channels of regular business.

On the same page was a report on industrial machinery exports in April, totaling over $24,000,000. These are in competition with the best products of European builders. Despite the alleged superiority of German and British metalworking equipment American manufacturers are selling steadily into both these countries, as well as in worldwide markets in which they compete.

One of the most important lines of machinery exports is power-driven metalworking equipment, machine tools, the machines that build other machines and probably the greatest civilizer among inanimate products. In this line American builders seem to have the lead in most markets, despite political considerations that have given Germany something of an advantage in some countries.

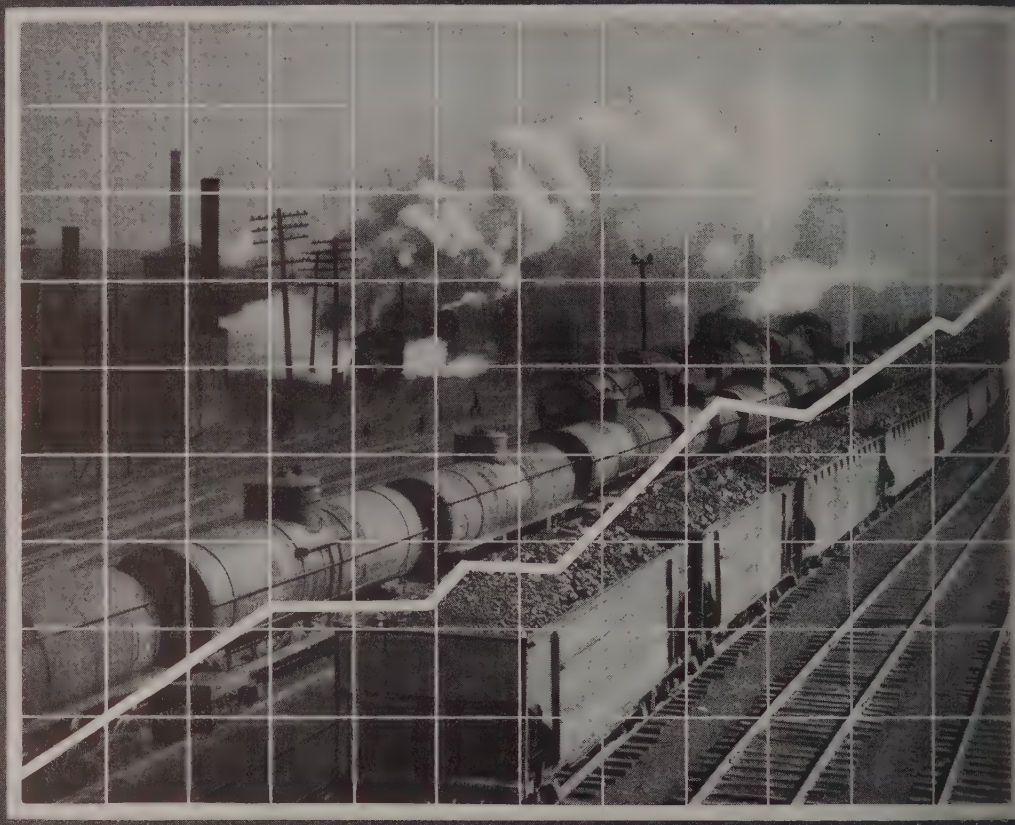
Tractor exports lead in the farm equipment field, developments giving superiority to American tractors doubtless running parallel with automotive progress in this country. American tractors seem to have the call over all others and form an important segment of foreign trade.

So, after all, the American salesman must have learned something about foreign selling. The figures prove it.

EXPORTER

*New York*

# YOUR *FUEL BILLS* MAY BE GOING UP



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AS production loads grow heavier, you're sure to spend more money for fuel. *How much more* depends largely on how well your equipment is insulated. The right types of insulation, properly applied, reduce heat losses . . . cut fuel costs . . . wherever they are used. And that is where the Johns-Manville Insulation-Engineering Service can help you.

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# STEEL

ESTABLISHED 1882

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# he Editor

# ws the News

AL letdowns in some directions are counted by activity in others, with the result the volume of business is practically unProducts now most in demand are tin tural shapes and concrete reinforcing bars. production last week declined 1 point to nt of ingot capacity (p. 27), most indiencouraging. Machine tool orders in May re at the highest level since April, 1937. (p. 27) were 6 per cent higher in May pril. STEEL's index of industrial activity s rebounded sharply and stands at the el since April 29. Automobile assemblies in gratifying volume and work on 1940 being pushed despite threats of further les.

• • •

parts inventories dropped rather sharply month of May and raw materials stocks ightly, according to results (p. 26) of STEEL's survey of recent inventory trends in the metalworking industry. . . . Actuated by a continued flood of new orders for airplanes, the aeronautical industry (p. 35) to initiate expansion programs. . . . Steel in Great Britain in May (p. 27) reached high level. . . . Tennessee Coal, Iron & o. (p. 29) will build a central ore condid sintering plant at Wenonah, Ala. . . . nal Association of Manufacturers (p. 34) ted a committee to determine whether any our patent system is necessary to aid busins to the railroads for equipment buying studied by the government.

• • •

able article, re-published in STEEL (p. 23) ermission of *Life*, Walter Lippmann, noted or, analyzes the reasons for the depressed state of mind that is so widespread in this country. "The American people," says Mr. Lippmann, "will move forward again, and feel once more the exhilaration and conat have made them what they are, when themselves to become conscious of their greatness, conscious not only of their incomparable inheritance but of the splendor of their destiny". . . Ways and means committee on Friday reported the proposed new revenue bill which is expected (p. 33) to be taken up today for consideration by the house. It contains a number of provisions more favorable to business than those of the existing law.

• • •

**Not Price Per Pound**

Guy Hubbard, STEEL's machine tool editor, sees no sound reason for thinking of machine tool investments on a price per pound basis. Rather, they should be considered (p. 44) from the standpoint of the profits they make possible when put to work in production lines. . . . William C. Stewart, technical adviser, American Institute of Bolt, Nut and Rivet Manufacturers (p. 46), points out a need for adjusting standard specifications for commercial nut threads that will more nearly represent good practice from the standpoints of manufacturers and users. Close limits, he points out, increase the cost out of all proportion to the slightly improved characteristics obtainable. . . . Superior Steel Corp.'s enlarged cold mill (p. 64) rolls stainless steel sheets up to 30-inch widths.

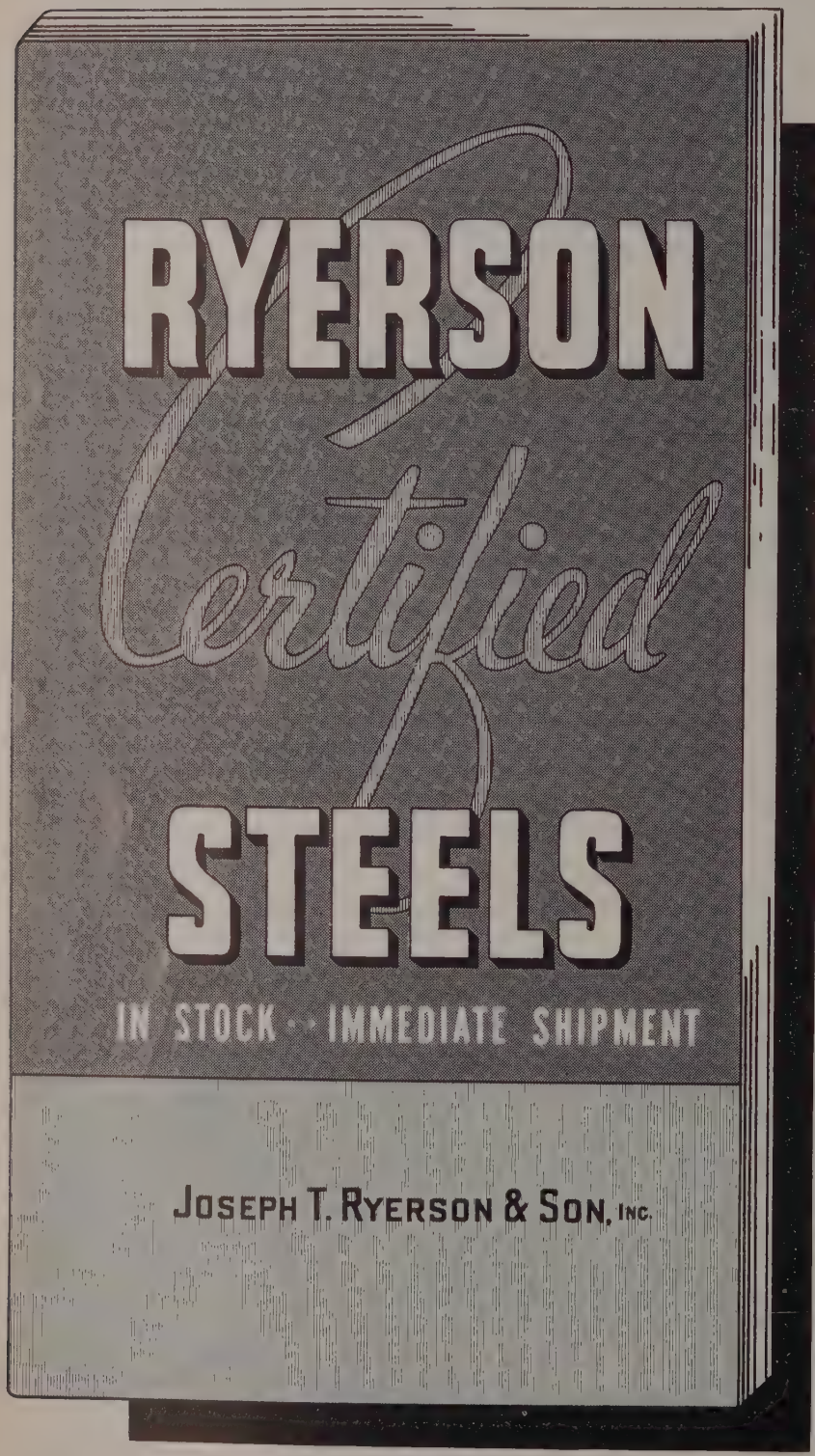
• • •

**New Plating Process**

A new process for plating aluminum (p. 56) applies tenacious coatings on aluminum and aluminum alloys in the forms of die castings and wrought and extruded parts, enhancing wear resistance, decorative effect and ease of soldering. . . . Carbon rods, plates and paste are used increasingly (p. 60) to control flow of molten metal in welding operations, with resulting economies. . . . Handling costs in a tin mill products warehouse have been reduced 50 per cent (p. 52) by use of a power fork-type lift truck which triples storage capacity on the same floor space. . . . Variable speed transmissions are being applied increasingly on punch presses; one user (p. 70) finds that they quickly repay their cost through higher operating speeds and increased production.

E C Kreutzberg

# The New Ryerson Stock L and Steel Data Book

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# HE AMERICAN DESTINY

BY WALTER LIPPMANN

*STEEL herewith reproduces from the June 5 issue of LIFE, by special arrangement with the publishers, an article entitled "The American Destiny," written by Walter Lippmann, noted commentator. Because it is an exceptionally clear and forceful analysis of problems which confront this country, STEEL believes it should be read by everyone, especially those whose thoughts and actions tend to mold the pattern of American life and government. It is such an article which inspires men to appreciate their opportunities; to work together, to do their best.—The Editors*

PEOPLE with a long habit of freedom holds
y in its possession the space to live, a fertile
vested wealth, the technical arts, everything
nation could need. Yet something is wanting.
or want of it the American people are pro-
y troubled. They know that they are not mak-
e most of their opportunities. They know
r lack of clear purpose and a confident will
re falling far short of what they have a right
ect of themselves. They are not at ease in
consciences. They know that with such re-
s, such riches, and such power they are stalled,
as they should be in action against poverty,
e stagnation of enterprise, and the crumbling
and civilized custom in the world all about

American spirit is troubled not by the dan-
and not by the difficulties of the age, but by
sion. Considering the resources with which
, and the accumulated achievements of the
and historic fate have endowed America, there
to be no question in anyone's mind about the
ican future. Yet in the generation to which
long, unlike any that went before, the Ameri-
eople have no vision of their own future. Lack-
his, they are seized by deep uncertainty. They
onfused by their problems. They are oppressed
oubt. They are living anxiously and unclearly
day to day, feeling that the strength within
is being wasted, is throttled, is suffocated, that
are dedicated to no great ends, that they have
re faith that enlists the young. This mood will
But while it obsesses the American spirit, the
e are making themselves sick with nervous in-
ion.

### Three Great Disappointments

e immediate cause of this indecision is, I be-
, the accumulated disappointments of the post-
era. Three times in these twenty years the
rican people have had a great hope and three
s they have been greatly disappointed. They be-
d with Wilson that they could help to make a
d that was safe for free men living in peace
r just laws. They believed with Coolidge and Hoover that they had arrived at a new era of certain and advancing prosperity. They believed with Roosevelt that they were organizing securely an abundant life for all the people. For the moment they are disillusioned and believe nothing in particular. When they are reminded how great are their resources, how splendid are their achievements, how decisive is their power in the world, they are embarrassed by the opportunities they are not using and by the challenge of a high destiny to which they are not responding.

Far from feeling inspired by the riches of the American earth, the generation to which we belong is now frightened by its fertility. It is as if this continent had raised up something too great for little men to deal with. For twenty years, under the influence of disappointed hopes, the people have worked themselves into a state of mind where today their ideas and their policies are dictated by a dread of the fertility of nature, by fear of the industry, the thrift, the inventiveness and the enterprise of men, by alarm at the prestige and the power of the nation. The attitude of the American people at this moment is one of recoil from those very constituents of greatness which vigorous peoples have hitherto everywhere and always struggled to obtain.

### We Seem To Have Too Much

They have let themselves be persuaded that in every phase of their activity they are threatened by the expansion of their power and must contract it, that they must withdraw, retreat, fence in, batten down, plow under, work less, save less, invent less, invest less, and risk nothing. For the moment, this moment of bewildered indecision through which we are now living, the American people are acting on the assumption, though in their hearts they reject it, that their incomparable assets are in fact their most dangerous liabilities.

That this is not a national policy but a national neurosis is evident when we realize that whereas the problems of other nations are the problems of insufficiency, our problems are the problems of superfluity. We seem to have too much of everything. We seem to have too much land. The land seems to

be too fertile. We have taken elaborate measures to reduce the yield, and we do not know how to dispose of the surplus. We seem to have too many factories, and the machinery seems to be too efficient, and we seem to have too much labor. We rack our brains to devise schemes for limiting the output and reducing the work done by the worker. We seem to have too much capital, and we worry about how to reduce our savings and about how not to invest them where they will produce too many goods. We seem to be too inventive, and we study plans for slowing up technological progress. We seem to have too much gold, and we bury it in Kentucky. We seem to have too much influence in the world and we examine devices for making ourselves as unimportant as possible.

### We Concentrate on Getting Rid of Surplus

In every field of our activity we have come to think that there is a surplus to be gotten rid of—a surplus of crops, of minerals, of industrial capacity, of gold, of savings, of credit, of labor, and of influence in the world. At the end of these twenty years our farm policy is an attempt to produce less and to dump the surplus. Our industrial policy is an attempt to protect old investments against the competition of new enterprise. Our fiscal policy, as conceived by those who direct it, is an attempt to reduce savings and to sterilize bank deposits and to bury gold. Our labor policy is an attempt to let more men work a little by making each man work less. Our foreign policy is regulated finally by an attempt to neutralize the fact that America has preponderant power and decisive influence in the affairs of the world.

However plausible a case can be made for this measure or that, the total effect is that the American people face the world not with their old confidence and courage, but in a mood of withdrawal, denial, defeat, and of wishing to escape from their opportunities and their responsibilities. This must be a transient mood. This must be the mood of a people whose minds and spirits are not yet adjusted to a radically new situation. Men say no to everything when they have not yet learned how, and have not yet nerved themselves, to say yes. For in the long run it cannot be true that a nation grows rich by not producing, by not working, by not saving, by not investing, by not being enterprising, by seeking only security and stability and protection from risks, by trying to be small and unimportant.

This cannot be the permanent attitude of the nation. It must be a passing mood, the curious mood of a peculiar epoch. For here is this continent, an island lying between two great oceans; the heart of it is invulnerable and the nation can never be conquered or intimidated. Upon this continent or within easy and fritndly reach of it, there is every material resource. The people who inhabit this continent selected themselves as colonists and emigrants out of the civilized nations of Europe: they are adventurous, enterprising, and brave with high faith. They are in full possession of the whole technology of modern science. They inherit an equipment of capital produced by prodigious labor and by immense investment. They have political institutions, which with all their faults in detail, are one o wonders of the world: nowhere else and never has so large a population lived in one union vast a territory with such security and in suc dom. Nothing that a people could want, nothi nations fight to obtain, nothing that men achieve is lacking, nothing except a clear p and the confident will to make the most of all things.

And why are they lacking? They have neve lacking before. This country has passed th many trying days. But never, in the bleak of Valley Forge or on the field of Gettysburg, lacked leaders who were confident of its de What is it, then, that has happened to this peo the post-war world that has shaken their confid They have not been wrecked by a calamity of n They have not been attacked and conquered b enemy. But for the moment they have lost the viction that they are moving forward, that the on their way and are going places.

They have lost their confidence, I submit, be three times in these twenty years they have st off with high hope to do great things that they never done before, and three times, on the firs tempt, they have been disappointed. First, they tervened in a world war, decided the issue, failed to establish a good peace. Then, they i vened as the creditor to restore the world's econ and failed. Then, they set out to give themselv secure and abundant life at home, and they have yet succeeded. In each movement they began enthusiasm and they have ended in disillusionm For the moment, they think they were deluded a Wilson when they saw themselves as the organ of world peace, under Coolidge when they wor for reconstruction, under Roosevelt when they wo for reform.

### Our Insight Is Good but Execution Is Bad

But the American people were not deluded what they undertook to do in the post-war These were the things that still have to be d They did not succeed on the first attempts bec they had not yet acquired the training or the exp ence that were needed in order to succeed. T were right under Wilson when they recognized tha a result of the war the power and influence of Am ica had grown so great in the world that on the p mount issues the position of the United States, w ever it did or refused to do, was decisive. The sight was true; the execution was gravely defec Neither Mr. Wilson nor his diplomatic assistants the congress nor the people at large had learned h to exercise successfully so much influence in the o world. The conduct of the foreign policy of a g power requires experienced men. That experie cannot be gotten in a few months or even in a years.

The American people were right under Cool when they recognized that as a result of the they had become the strongest creditor power, that this gave them a vital interest and a clear o gation to take a leading part in the reconstruc of the money and the credit and the commerce the world. But the American bankers and Amer

of the twenties had had almost no ex-
n such affairs; American business men
t learned to understand the difference be-
commercial policy of a debtor nation and
creditor nation.

der Roosevelt the American people were
n they recognized that the time had come
nation must organize itself to control the
booms and depressions, must take mea-
preserve its agriculture and to restore the
o conserve natural resources, must guaran-
men an opportunity to work, must provide
or the young, the old, the sick anl the
ed. But the wisdom to do all these things
equal to the need for doing them. Mr.
s New Dealers were as untrained and ill-
to design and administer these reforms
en Mr. Wilson's diplomats and Mr. Cool-
anciers.

moment, therefore, a large part of the peo-
concluded that in each of these three under-
f the post-war era the objective was wrong.
k upon the tragic consequences of Ver-
proof that it was a mistake to attempt to
the world for peace under the reign of law.
k upon the crash of 1929 and the defaulted
d the wasted savings as proof that it is a
for the world's creditor to extend credit.
k now with dismay upon the unending
nd the millions of unemployed and the stag-
f business. These failures and disappoint-
ve for the time being turned a substantial
against domestic reforms, against general
ction, and against organized peace. They
oduced the thoroughly disillusioned Ameri-
he present day who wants to withdraw with-
hree-mile limit, wants to bury the gold, and
suspend the reforms.

### efuse To Go on with Things We Started

ubt this reaction is human enough. But a
ly reactionary state of mind is hardly suited
successfully with the problems of a dynamic
n the contrary, the more we have refused to
ith the things we undertook to do, and failed
ve, the more compelling and urgent do these
come. Twenty years ago the congress re-
proceed with the difficult work of organiz-
world for peace. The refusal has not set-
issue. It is more acute today than it ever
ore, and never in time of peace has the United
ad to arm on such a scale as it is arming
Ten years ago we refused to go on with the
reconstructing the shattered economy of the
The refusal has not made easier, in fact it
gravated, the difficulty of reconstructing our
omestic economy. Now we are at the point
a considerable number of the voters think they
like to put an end to social reforms. If these
prevail, we shall soon find that the discontent
necessary even more drastic social reforms.

ve all we are finding that when a nation refuses
he great things which it has to do, it is unable
the littler things that it wishes to do. The
to accept the large responsibilities is demoral-
Men who will not face the big things become
generally nervous and fearful in all things. The attitude of negation, of not producing, not working, not saving, not investing, not competing, not trading, not exercising influence, is simply the morbid rationalization of the general refusal to accept the American destiny in the post-war world.

That is what ails us today. In the lifetime of the generation to which we belong there has occurred one of the greatest events in the history of mankind. The controlling power in western civilization has crossed the Atlantic. America, which was once a colony on the frontiers of Europe, is now, and will in the next generations become ever more certainly, the geographic and economic and the political center of the Occident. All the world knows this and acknowledges it. The American people have known it under Wilson, under Coolidge, under Roosevelt, in their great undertakings after the World war. They were following the American destiny. And, with all its risks, all its responsibilities, all its anxieties, after all the disappointments and failures, they will have to go on with it. There is no way to refuse this destiny.

### America Will Lead World Tomorrow

What Rome was to the ancient world, what Great Britain has been to the modern world, America is to be to the world of tomorrow. We might wish it otherwise. I do. Every man who was young in the easier America of the pre-war world must long for it at times. But our personal preferences count for little in the great movements of history, and when the destiny of a nation is revealed to it, there is no choice but to accept that destiny and to make ready in order to be equal to it.

The indecision which paralyzes us today will not be ended by reassuring statements from the White House, or by little changes in this or that policy, or by a change of party control. The indecision which pervades the American spirit, and manifests itself in the policies of plowing under, not producing, not saving, not investing, has its root in the refusal by the American people to see themselves as they are, as a very great nation, and to act accordingly. We are negative today in all things because we have shrunk from being positive in the big things. We are undecided, nervous and torn because we are confronting the problems of the twentieth century with minds formed in the nineteenth century, and attached to the smaller duties of a simpler past. We are afraid of the fertility of the American earth, afraid of the productiveness of American capital and American labor, afraid of American influence in the family of nations, because we still cling to the mentality of a little nation on the frontiers of the civilized world, though we have the opportunity, the power, and the responsibilities of a very great nation at the center of the civilized world.

The American people will move forward again, and feel once more the exhilaration and the confidence that have made them what they are, when they allow themselves to become conscious of their greatness, conscious not only of their incomparable inheritance but of the splendor of their destiny. Then the things that seem difficult will seem easy, and the willingness to be equal to their mission will restore their confidence and make whole their will.

# Metalworking Plants Reduce Raw Materials, Finished Parts Stocks

■ METALWORKING companies reduced finished parts inventories rather sharply from April 30 to May 31, while raw materials stocks declined only slightly, a survey of representative firms by STEEL indicates.

Forty-two per cent of the companies covered reduced stocks of finished parts; 26 per cent reported no change; and 32 per cent increased finished parts on hand.

Thirty-five per cent had less raw materials on hand at the end of May than at the beginning; 32 per cent held stocks constant; 33 per cent increased raw materials stocks.

These data are contained in replies to questionnaires addressed to presidents of medium-sized metalworking companies in every geographic section. The questions:

1. How much was your raw materials inventory value on May 31 above (or below) that on April 30?

2. How much was your finished parts inventory on May 31 above (or below) that on April 30?

3. At your present rate of operations, how long will your raw materials inventory last?

Thirty-two per cent of the companies replying said raw materials on hand would last less than 31 days; 62 per cent reported supplies insufficient for two months.

Of those with larger raw materials stocks, 14 per cent estimated supplies would last two to three months; 18 per cent, three to six months; 4 per cent, six to nine months; and less than 2 per cent had enough raw materials to last more than nine months.

Inventory reductions were attributed partially to seasonal influences by some fabricators, who normally expect a seasonal lull during the summer. A few said they were reducing stocks in preparation for June 30 inventories and accounting.

Others stated they took advantage of concessions in steel prices during the early part of May and increased stocks. One fabricator doubled raw materials stocks, commented: "Steel price down. Took advantage of price and loaded up."

How stocks, raw materials and finished parts fluctuated is shown in the following table:

| Inventory Movement | Raw Materials | Finished Parts |
|---|---|---|
| (All figures in percentages) | | |
| Up 25 or more | 5.6 | 7.2 |
| Up 10-24 | 12.5 | 8.7 |
| Up 1-9 | 15.3 | 15.9 |
| Unchanged | 32.0 | 26.1 |
| Down 1-9 | 15.3 | 23.2 |
| Down 10-24 | 16.6 | 14.5 |
| Down 25 or more | 2.7 | 4.4 |

Optimistic notes, accompanying returned questionnaires: "Re-ordering every week as our inv... are low. We have only ... month or six weeks' inven... hand and this really is too s... a working inventory."

Another comments: "O... ness is up about 17 per c... expect it to hold that level ... We have no excess stocks."

A Mid-Westerner reports ... steel and wire consumption ... 35 per cent over 1938."

Still another finds "prospec... with new business immediate... ing." He complains, howev... "business lacks pep in its ... today. Everyone is listless ... to be pressured. Deliveri... poor from our sources."

## Machine Tool Orde... Reach 25-Month Pe...

■ May machine tool orde... the highest since April, 1... cording to the National ... Tool Builders' association, ... land. Increase in both d... and foreign orders carried ... sociation's index to 219.8, co... with 155.6 in April and 66.7 ... 1938.

Three months average i... 186.9.

Orders for foreign delive... the first five months this y... heavier than for the compar... riod in 1937, and represent a... share of the total.

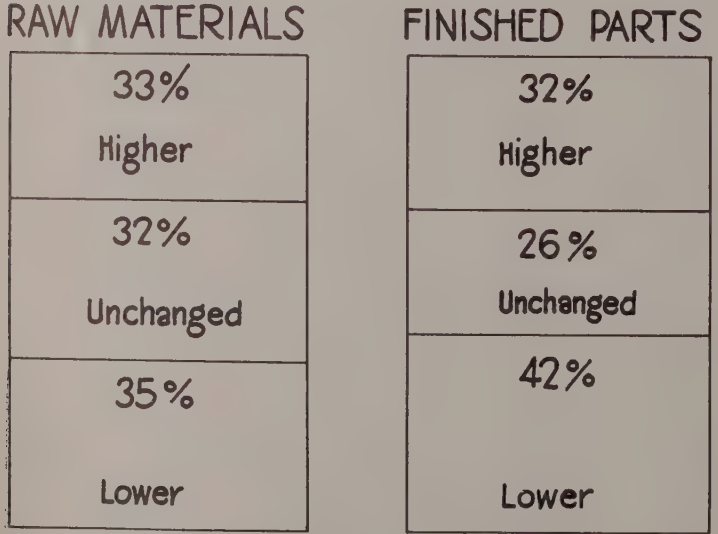
Domestic business for pa... months is 43 per cent above ... tal for the last five months ...

## Steel Corp. Shipmen... Up 3 Per Cent in Ma...

■ United States Steel Corp... ished steel shipments in ... amounted to 723,165 tons, ... tons, or 3 per cent, more tha... 459 tons in April. Compare... 465,081 tons shipped in May... the increase was 258,084 to... 55.4 per cent.

Five months' shipments thi... totaled 3,659,833 tons, 1,127,53... larger than 2,532,297 tons in t... five months last year.

### As Plants Reported Trend of Inventories in May




■ **Finished parts inventories were reduced in May by 42 per cent of the metalworking firms replying to STEEL'S questionnaire; increased by only 32 per cent, the remainder being unchanged. Thirty-five per cent of companies reduced supplies of raw materials, while 33 per cent increased their stocks**

**U. S. STEEL CORP. SHIPMEN...**
(Inter-company shipments not incl...

| | (Tons) | | |
|---|---|---|---|
| | 1939 | 1938 | 1937 |
| Jan. | 789,305 | 518,322 | 1,149,918 |
| Feb. | 677,994 | 474,723 | 1,133,724 |
| March | 767,910 | 572,199 | 1,414,399 |
| April | 701,459 | 501,972 | 1,343,644 |
| May | 723,165 | 465,081 | 1,304,039 |
| June | .... .. | 478,057 | 1,268,550 |
| July | ..... | 441,570 | 1,186,752 |
| Aug. | ..... | 558,634 | 1,107,858 |
| Sept. | ..... | 577,666 | 1,047,962 |
| Oct. | ..... | 663,287 | 792,310 |
| Nov. | .... .. | 679,653 | 587,241 |
| Dec. | ..... | 694,204 | 489,070 |
| Adj.* | ..... | ‡30,381 | †77,113 |
| Total | ..... | 6,655,749 | 12,748,354 1 |

*Yearly adjustment. †Deduction. ‡

# ish Steel Record High

AT BRITAIN'S steelmakers ned a new production record making 1,218,100 gross tons ingots and castings, as re- n STEEL's cablegram, page 98. is an increase of 39,800 tons e previous peak output, 1,- in November, 1937.

h steel production first 1,000,000 tons per month in September, 1027,000 tons, tober 1,060,500 tons, each a gh. In March, 1937, the ton- ached 1,109,500, and in Sep- that year, 1,163,000.

production in 1937 was the in the history of the British y, 12,964,000 gross tons. This e exceeded in 1939 on the f present conditions. Five total is 5,230,000 tons. Out- all 1938 amounted to 10,393,- .

port to the department of ce from its London office arly months this year found cial demand for steel was cause of political uncertain-

t European developments rought about a complete and heavy government or- r air-raid shelters and other war materials have caused capacity operation. Shipbuilding also has increased greatly under government assistance.

Consumers fear a repetition of the shortage experienced in 1937 and are placing protection orders. Sheet demand greatly exceeds supply and purchases are being made on the Continent. Imports are being increased. Scarcity of scrap has caused greater use of pig iron in steel production. During the first quarter 17 blast furnaces were added, 12 being engaged in producing iron of the various steelmaking grades.

## District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

| | Week ended June 17 | Change | Same week 1938 | Same week 1937 |
|---|---|---|---|---|
| Pittsburgh ... | 40 | — 3 | 23.3 | 92 |
| Chicago ..... | 49.5 | — 3 | 22 | 63.5 |
| Eastern Pa... | 37 | None | 26 | 67 |
| Youngstown.. | 52 | + 1 | 27 | 30 |
| Wheeling .... | 73 | None | 35 | 93 |
| Cleveland ... | 55.5 | + 2.5 | 31 | 46 |
| Buffalo ..... | 44 | None | 28 | 89 |
| Birmingham.. | 71 | + 4 | 58 | 83 |
| New England. | 40 | None | 25 | 82 |
| Cincinnati ... | 73 | + 5 | 28 | 93 |
| St. Louis..... | 42 | — 5 | 39.3 | 93 |
| Detroit ..... | 57 | None | 21 | 97 |
| Average.... | 52.5 | — 1 | 27 | 75.5 |

# y Gear Sales Up 6 Per Cent

R sales in May were 6 per gher than in April, according American Gear Manufac- association, Wilkinsburg, Pa. sociation's index (1928 repre- 100) rose five points to 93. pared with May, 1938, the im- ent is 33 per cent, the index month being 70.

five months of 1939 reflect a 14 per cent over the same last year.

recognized that gearing is ely related to practically every industry," comments the association, "and for this reason the trends in the gear industry form a dependable barometer as to industrial trends in general."

The association's data on gear sales are obtained from merchant sources and do not include gears for mass production consumer goods, such as automobiles. The monthly index figures, with graph, through arrangement with the association, hereafter will appear regularly in STEEL.

## dex Showing Trend of Gear Sales from 1928

(Year 1928 = 100%)

| n. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total (Per ct.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 86 | 104 | 88 | 93 | ... | ... | ... | ... | ... | ... | ... | ... |
| 3 | 77 | 91 | 74 | 70 | 58 | 67 | 76½ | 80½ | 72½ | 72 | 81 | 76 |
| 4 | 130½ | 195 | 164 | 125½ | 134 | 124 | 125 | 123 | 139½ | 127½ | 97 | 135½ |
| 0½ | 93 | 92 | 105 | 105 | 105 | 107½ | 113 | 115½ | 112 | 122½ | 132½ | 107½ |
| 5½ | 63½ | 64½ | 68½ | 75½ | 66½ | 78½ | 95 | 78 | 77½ | 69½ | 80 | 73½ |
| 3 | 44 | 58 | 52 | 55½ | 58 | 55 | 59 | 54 | 50 | 50½ | 57 | 53 |
| 6 | 23½ | 26 | 26 | 58 | 73 | 62 | 57 | 47 | 47 | 47 | 46 | 43½ |
| 2 | 41 | 36 | 28 | 23 | 27 | 27 | 32 | 28 | 27 | 25 | 30 | 30 |
| 5 | 73 | 62 | 62 | 93 | 55 | 69 | 52 | 45 | 38 | 35 | 42 | 57½ |
| 7 | 95 | 109 | 102 | 106 | 100 | 104 | 106 | 100 | 98 | 96 | 98 | 99½ |
| 4 | 121 | 140 | 131 | 137 | 129 | 134 | 137 | 129 | 126 | 123 | 126 | 128½ |
| 7 | 95 | 109 | 102 | 106 | 100 | 104 | 106 | 100 | 98 | 96 | 98 | 100 |

# PRODUCTION

■ STEELWORKS operations last week declined 1 point to 52.5 per cent. Increases were noted in four districts and declines in three; five were unchanged. Year ago the rate was 27 per cent, two years ago 75.5 per cent.

**Youngstown, O.**—Gain of 1 point to 52 per cent. This week the rate is scheduled to move up 4 points to 56 per cent, as all producers add open hearths to a total of 48 and bessemer operation is increased to 12 turns per week.

**Birmingham, Ala.**—Up 4 points to 71 per cent. Republic Steel Corp. added its fifth open hearth at Gadsden, Ala. Tennessee company has lighted a blast furnace at Ensley works.

**Detroit**—Unchanged at 57 per cent for the fourth consecutive week.

**Pittsburgh**—Down 3 points to 40 per cent.

**Wheeling**—Steady at 73 per cent, all interests continuing production to meet consumer demand.

**Central eastern seaboard**—Continues at 37 per cent with no indication of change for remainder of month.

**Buffalo**—Holding at 44 per cent for the third week.

**New England**—Remains at 40 per cent but will drop to 30 per cent this week, one unit taking off all open hearths until July 10.

**St. Louis**—Declined 5 points to 42 per cent. Some plants expect further curtailment this week.

**Chicago**—Receded 3 points to 49.5 per cent. Sharp reduction by one steelworks offset gains by two smaller mills.

**Cincinnati**—Reached a new high for the year at 73 per cent, a 5-point gain. Part of current output is in anticipation of a shutdown by one mill next month.

**Cleveland**—Rose 2.5 points to 55.5 per cent, best rate in 16 weeks.

## Carpenter Steel Marks Fiftieth Anniversary

■ Carpenter Steel Co., Reading, Pa., celebrated its fiftieth anniversary recently with a banquet attended by all executives and the entire sales force.

First steel was made June 7, 1889, six days after the company's organization. The old Philadelphia & Reading rail mill had been leased for preliminary operations and in November the Union Foundry was purchased and production moved there, the site of the present plant. By the end of the year the payroll numbered 62. Present number of employes is 1221, of whom 101 have been in the company's service 25 years or more.

# Charges "Smear" By Labor Board

*WASHINGTON*

■ COUNSEL for the American Rolling Mill Co., Robert T. Caldwell, appeared last week before the senate committee on education and labor, now holding hearings in connection with the Wagner labor act.

During his testimony, Mr. Caldwell discussed in considerable detail the case the national labor relations board has against the company. He charged NLRB agents have made "deliberate attempts to smear a reputable employer."

The question involving the Ashland, Ky., plant of the company still is before the board.

Mr. Caldwell cited a statement by Philip G. Philipps, NLRB regional director, who filed the complaint, that it was one of the most sweeping ever undertaken by the board.

He recounted the incidents leading up to an election conducted at the Butler, Pa., plant of the company to determine whether the CIO should be designated the bargaining agent for its employes, and the resultant defeat of the CIO by 3 to 1.

**Made Sensational Charges**

"During the negotiations concerning this election in the Butler plant," Mr. Caldwell continued, "rumors were current that if the CIO failed to win the board would file a complaint against the company at Ashland and throw out the representation plan there. These rumors increased after the election, and on May 28, 1938, Mr. Phillips phoned me from Cincinnati, saying he had received from the labor board a complaint against the company and extended to me the usual invitation to come to his office to discuss the matter. He asked if I would accept service of the complaint there in order to avoid publicity. I agreed to this and we made an engagement for me to call on him following my arrival from Ashland.

"However, before my meeting with Mr. Phillips, he had called in the representatives of the press, given them copies of the complaint which had not yet been served, and issued a release of a highly inflammatory nature against American Rolling Mill Co. Charges in the regional director's press release included: Agents of the company had 'assaulted and brutally beaten' organizers; had broken into union offices and stolen records; had dominated the municipal government and civic organizations of the city; had caused the publication of anti-union news items; and had co-operated with other employers and associations in antiunion activities. At the hearing these chargese were withdrawn from the board's complaint and no effort made to prove them."

F. H. Fowler, president of Foote Bros. Gear & Machine Corp., Chicago, also appearing before the committee, stated the national labor relations board had required him to employ for a hearing a board-approved stenographer who charged $1 a page for a 3250-page record.

## Rules Two Cold-Rolling Patents Are Valid

■ Validity of two patents owned by the Cold Metal Process Co., Youngstown, O., covering a process for cold rolling steel was upheld by the United States circuit court of appeals at Philadelphia in a decision given last Friday. The court held Carnegie-Illinois Steel Corp. and the United States Steel Corp. had infringed these patents. Three companion patents were declared invalid on the ground their ideas involved only "engineering skill" and not "inventive genius."

Damages to which the court ruled the Cold Metal Process Co. is entitled will be determined by a special master to be appointed by the federal court of New Jersey, where the litigation orifiinated. In the earlier suit filed by the Youngstown company, four of the five patents were held invalid and one valid. Cold Metal appealed from the invalidation of the four patents, while the Steel corporation appealed from the decision it had infringed the other patent.

## Monarch To Hold Open House at New Plant

■ Completion of its new factory and office building will be celebrated by Monarch Machine Tool Co., Sidney, O., with open house June 24 and 25.

Following a dinner meeting on Friday, 400 members of the National Association of Foremen will preview the modern air-conditioned plant. To be held in Monarch's new auditorium, the dinner will be addressed by Capt. A. A. Nichoson, personnel manager of the Texas Corp.

Several thousand visitors are expected during the open house, whose feature is an exhibit demonstrating how machine tools have made possible modern civilization's high standard of living. Many leading equipment manufacturers are participating.

This expansion has increased Monarch's floor space 35 per cent to 135,000 square feet, brings employment to the highest level in its history.

# French, Englis Industries Bus

■ CLIFFORD S. STILWELL president, the Warner & Swas Cleveland, who visited Euro October and November, has turned from another trip which included France and E

Mr. Stilwell was impress the abrupt change that has oc in the attitude of the Fren British people during the months elapsing between his Last fall, France was torn ternal dissension. Labor wa sullen mood. The nation to have no settled policy a people were troubled by ind At the same time, England w fering from confusion as to al policy and from increasing a as to the outcome of cont disturbances.

Today, according to Mr. S most of the signs of muddle pose, indecision and internal have disappeared. Instead on the people of both nations w with determination and uni fort toward definite objective

**Work-Week Longer**

In France all thought of hour week has disappeare workmen are engaged up to a as 55 hours a week. In Engla Stilwell found new industrial ings going up at an unprece rate. These new plants are constructed substantially and ing equipped with the latest efficient machinery. British a ties believe England's produc material and equipment fo paredness either has passed pass before July Germany's in this respect.

In spite of the fact Engl putting forth every effort pare itself for any emergen manufacturers are being ca preserve their foreign mark France, Mr. Stilwell found plants are buying machine from England on five or six delivery. At the same time, manufacturers—unable to enough machine tools for the eign trade as well as for the of their domestic preparedne gram—are buying machine t America at higher prices an extended deliveries to make deficiency. This, in the opi Mr. Stilwell, is a good illus of the traditional acumen British in foreign trade.

He believes that United machine tool builders will c to receive considerable volu business from England.

## ils in "World 'omorrow"

*NEW YORK*

T metals will mean in to- s world is dramatically por- or World's fair visitors at l of the Future," featured f United States Steel Corp. ies in the corporation's steel building.

ting today's discoveries into applications of the future, s have built in panoramic e highway, farm, factory, home of tomorrow. Mod- exact scale are radio-operat- s, prefabricated houses with liding in place like desk and elevated pneumatic speeding travelers by air

ory of steel today—founda- tomorrow—is related by bit with animated dioramas close-up views of modern oduction. Details are de- rom iron ore mining to roll- hed products.

are particularly intended y the magnitude of mill op- the ease and assurance of hundred-ton loads. To per- tors to enjoy the spectacu- ity of molten metal during the dioramas showing enes at blast furnace and arth are accompanied by lighting effects.

to the corporation's ex- eme, "Steel Thinks Ahead", l of Research" describes the search for new fields of for man's most useful met- how intensive study of steel's properties enable the steelmaker to control its production in a thousand different forms.

Throughout the hall are practical demonstrations of the unusual performance of the "controlled steels" so essential to modern industrial development.

## T.C.I. To Build Central Ore Conditioning Plant

■ Tennessee Coal, Iron & Railroad Co. soon will start construction of a central ore conditioning and sintering plant at Wenonah, Ala.

When the plant is completed late next year, ore crushing at individual mines will be discontinued. Ore will be loaded directly into railroad cars at the mines and taken to the central plant, where it will be dumped into a primary crusher. Belt conveyors will carry it to a second crushing station for final reduction.

Leaving the secondary crusher, ore will go to a screening and continuous sampling station where it will be separated into coarse, medium or fine sizes. Coarse and medium grades will be stored in steel silos, and chemical analyses made before removal to blast furnaces. Fine grade ore will be conveyed from screening station to storage bins at the sintering plant. Flue dust and coke braize will be stored in adjacent bins. Part of the fine ore will be mixed with these and sintered.

Some alterations of ore stocking facilities at the company's Fairfield blast furnaces will be required to co-ordinate the ore conditioning program.

**steel is made" is depicted by United States Steel subsidiaries in their rk World's fair exhibit. Moving dioramas, 1/25 actual size, reproduce each operation. Shown above is the blast furnace replica**

# 1938 Scrap Use Off 44 Per Cent

■ DOMESTIC consumption of steel and iron scrap in 1938 totaled 21,344,934 gross tons, 44 per cent less than 38,006,272 tons in 1937, according to compilations by the bureau of mines, department of interior. Consumption of pig iron amounted to 18,504,349 tons, 46 per cent less than 34,056,527 tons in 1937. Scrap charged to steel furnaces declined 45 per cent, and to iron furnaces 41 per cent.

Increased use of purchased scrap in iron furnaces caused a decrease in proportion of pig iron used, from 35.1 per cent in 1937 to 33.1 in 1938. In steel furnaces net result of increased scrap use was a slight decrease in use of pig iron, from 50.4 per cent in 1937 to 50.1 per cent in 1938.

Open-hearth furnaces in 1938 consumed 14,607,630 tons of scrap, 68 per cent of the total; in 1937 open hearth consumption was 26,414,037 tons, 69 per cent. Pennsylvania was the largest scrap consumer, 4,736,524 tons; Ohio second, 4,161,317 tons; Indiana third, 2,387,284 tons; Illinois fourth, 1,879,204 tons.

Exports of scrap in 1938 totaled 2,998,607 tons, 14 per cent as much as domestic consumption; in 1937 4,101,549 tons, 11 per cent. Japan took 46 per cent of the total, Italy 14 per cent and the United Kingdom 13 per cent, in 1938.

### SCRAP CONSUMPTION 71 PER CENT OVER LAST YEAR

Domestic scrap consumption continues heavier than last year and scrap exports are running behind 1938, the Institute of Scrap Iron and Steel Inc. reports. Consumption in four months this year totaled 9,474,117 gross tons, an increase of 71.2 per cent over the 5,538,212 tons melted in the comparable period of 1938. Exports at 1,115,183 tons in first four months were 20.3 per cent less than 1,261,927 tons shipped abroad in comparable 1938 period.

## Germany Broadens Use Of Aluminum Alloys

■ Light metals, such as aluminum and aluminum alloys, are being used increasingly in the German four-year plan, replacing steel, nonferrous metals and other structural materials, according to reports to the department of commerce from its Berlin office.

Principal aluminum alloys are said to be aluminum-magnesium, aluminum-magnesium-silicon, aluminum-copper-magnesium.

# MEN OF INDUSTRY

■ M. A. WILLIAMS has been appointed district sales manager in the Indianapolis territory for Republic Steel Corp. He has been in charge of Union Drawn Steel division sales in that territory and the two positions will be combined. Mr. Williams entered the steel industry in 1911 with Cambria Steel Co., Johnstown, Pa. Eight years later he became associated with La Salle Steel Co., in Chicago, which was followed by an association with Bliss & Laughlin Inc., in Harvey, Ill. He was made district sales manager at Indianapolis for Union Drawn Steel Co. in 1927. S. G. Disque continues as assistant district sales manager.

♦

E. D. Hollinshead, formerly assistant to manager, public relations department, Chicago district, Carnegie-Illinois Steel Corp., has been named manager of real estate.

♦

Roger C. Jones has been appointed representative in the lower New England territory by Philadelphia Gear Works. His headquarters will be in Hartford, Conn.

♦

C. E. Barner has joined Wright Mfg. division of American Chain & Cable Co. Inc., Bridgeport, Conn., as district sales manager, with headquarters in Cleveland. He has had wide experience in the material handling field.

♦

Samuel L. Hoyt, since 1931 engaged in research with A. O. Smith Corp., Milwaukee, has become associated with Battelle Memorial institute, Columbus, O., as metallurgical research advisor. He is well known for his work in developing cemented tungsten carbides for cutting tools and on temperature-resistant alloys. He has been a director and active

Samuel L. Hoyt

M. A. Williams

committee worker in the American Society for Metals, is a member of several committees of American Institute of Mining and Metallurgical Engineers, and a member, Institute of Metals.

♦

Luke E. Sawyer, formerly assistant general superintendent, Babcock & Wilcox Tube Co., Beaver Falls, Pa., has been promoted to general superintendent.

♦

T. G. Roberts, Harrison building, Philadelphia, has been appointed agent for SAE Steels Inc., Cleveland, in Philadelphia district and territory extending to the south. Mr. Roberts also represents the Fitzsimons Co., Youngstown, O., and the E. W. Ferry Screw Products Co., Cleveland.

♦

Parker F. Wilson, formerly with Wheeling Steel Corp., Wheeling, W. Va., and at one time vice president and general manager, Otis Steel Co., Cleveland, has been elected president. Pittsburgh Steel Foundry Corp., Glassport, Pa., succeeding G. A. Hassel, who becomes chairman of the board.

♦

J. E. MacCloskey Jr., vice chairman, Harbison-Walker Refractories Co., Pittsburgh, has been elected chairman of the board, to succeed the late J. E. Lewis. H. B. Campbell has been made a director, to fill the vacancy caused by death of Mr. Lewis, and also has been elected a vice president. Mr. Campbell will be in charge of operations.

♦

Norman A. Lincoln has been appointed works manager of Evans Products Co., Detroit. Mr. Lincoln has been associated with production and purchasing in the automotive industry over 20 years, having been active with Hupp Motor Car Corp. 19 years, finally becoming director

of purchases; later joining t ley Radio Corp., Cincinnati sist on production and a plans for the new Crosley his new capacity Mr. Linc have charge of all manuf and allied departments.

♦

J. H. Morrison has been superintendent of hot rollin tions of Pittsburgh Stee Monessen and Allenport, Pa. Prior to joining Pittsburgh 1936 he was with Sharon Ste and previous to his present ment was superintendent rolling works in Monessen.

♦

E. T. Eggers, who join American Steel & Wire Co land, in 1934 as a salesman Philadelphia office and subs ly was transferred to Dal then to Houston, Tex., ha named by the company as representative on wire rope Gulf Coast oil fields. His he ters will be in the Praetoria ing, Dallas.

♦

A. D. Masters, assistant m Terre Haute, Ind., branch o Co., Chicago, has been nam ager, succeeding W. E. Mill has been granted an indefini of absence due to ill healt Foster has been made a manager.

M. W. Link, consulting e in the company's research gineering division, has bee manager of marine sales. ceeds the late E. L. Brugman

♦

John Edward Jackson h elected president, Pittsbu Moines Co., Pittsburgh. He s his father, the late W. H. Since graduation from Iow college, Mr. Jackson has be ciated actively with various ments of the company and i ate, Pittsburgh-Des Moines S He was manager of the inc department a number of ye

John E. Jackson

935 has been general manstruction department.

m R. Jackson has been a director, Pittsburgh-Des Co. and also assistant secred treasurer. List of other is unchanged.

♦

n A. DeLo has been named romotion and advertising r, Continental Steel Corp., , Ind. Associated with the tion since 1932, he formerly istant advertising manager. s to that Mr. DeLo was en- newspaper work in Kokomo where in the Middle West as nd advertising manager.

♦

Erikson has been appointed esident in charge of sales, Corp., Pittsburgh, and its ry companies, Hall Laborac., Buromin Co. and Calgon r more than 20 years Mr.

D. J. Erikson

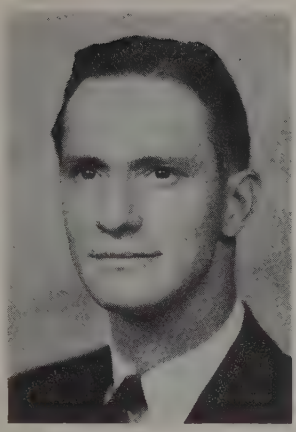
has been active in promotgrowth of the corporation's enterprises. He has served tant to president, sales man- Calgon Inc., and formerly es manager, devoting his efthe sale of Hagan automatic tion control.

♦

R. Vivian, advertising manitzler Color Co., has been president, Industrial Market-Detroit, chapter of the Naindustrial Advertisers' asso- Other officers are: Vice nt, Thomas B. Moule, adver- manager, Ex-Cell-O Corp.; y, Lyle D. Worden, Morse Co.; treasurer, John Ash-r., commercial division, Nashtor Corp.

♦

nt Hubbard, president, Maners Association of Connecvas re-elected chairman of rd, National Industrial Con- board, New York, at its third annual meeting re- in New York. Irenee du ice chairman, E. I. du Pont



Joseph A. DeLo

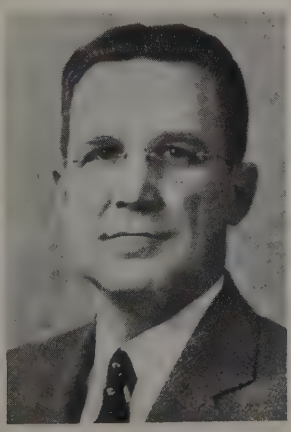
de Nemours & Co., was re-elected vice chairman, as was Walter J. Kohler, chairman, Kohler Co. Newly elected vice chairmen are Neal Dow Becker, president, Intertype Corp., and David M. Goodrich, chairman, B. F. Goodrich Co. Dr. Virgil Jordan, who has served the board 18 years, will continue as president.

■

Frank B. Williams Jr. has resigned as vice president in charge of the merchandising division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., effective July 1. Before taking charge of the Westinghouse merchandising division, Mr. Williams had been vice president, Diehl Mfg. Co., Elizabethport, N. J. Frank R. Kohnstamm, sales manager of the merchandising division, from July 1 will report to Ralph Kelly, vice president in charge of sales. L. E. Osborne, manager of manufacturing and engineering, merchandising division, from July 1 will report to George H. Bucher, president.

♦

N. N. Shepherd, formerly with Carboloy Co., has joined Firth-Sterling Steel Co., McKeesport, Pa., as a Firthite engineer with headquarters in Chicago. Other additions to the company's sales-engineering staff are: Clifford W. Nitchie, formerly with Vascoloy - Ramet Corp., as a Firthaloy die engineer, also in Chicago; Leslie T. McKinnon, heretofore with Braeburn Steel Corp., as a steel sales representative in Detroit; George L. Sharpe, previously with Tungsten Carbide Tool Co. and Michigan Tool Co., as Firthite sales representative in Detroit; A. W. McCoy, formerly with Carboloy Co. and Union Wire Die Co., as a Firthaloy engineer in New York, replacing J. W. Mordica, who has been transferred to McKeesport; and F. H. Becker, who has been transferred from Detroit to Syracuse, N. Y., where he will be a Firthite engineer.



Lloyd R. Vivian

# DIED:

■ J. ALBERT MATTSON, 65, sales representative for Firth-Sterling Steel Co., McKeesport, Pa., in the New England district, at his home in Chicago, recently. He had been with the company 31 years, in Chicago, Cincinnati and Boston.

■

Frederick P. Tessmer, treasurer, Tessmer Machine & Tool Co., Detroit, recently in Detroit.

■

David S. Spacke, 54, one of the founders, Spacke Machine Co., Indianapolis, maker of machine tools, recently in that city.

♦

L. S. Maremont, 63, one of the original founders of Maremont Automotive Products Inc., Chicago, in that city, June 8.

■

David E. Knall, 47, vice president, Calumet Foundry & Machine Co., East Chicago, Ind., in Chicago, June 11.

♦

John M. Westerlin, 84, president, Westerlin-Campbell Co., refrigerating machinery manufacturer, Chicago, June 10 in that city.

♦

Rankin H. Roberts, 58, director and supervisor of buying, Hibbard, Spencer, Bartlett & Co., Chicago, June 11 in Chicago.

♦

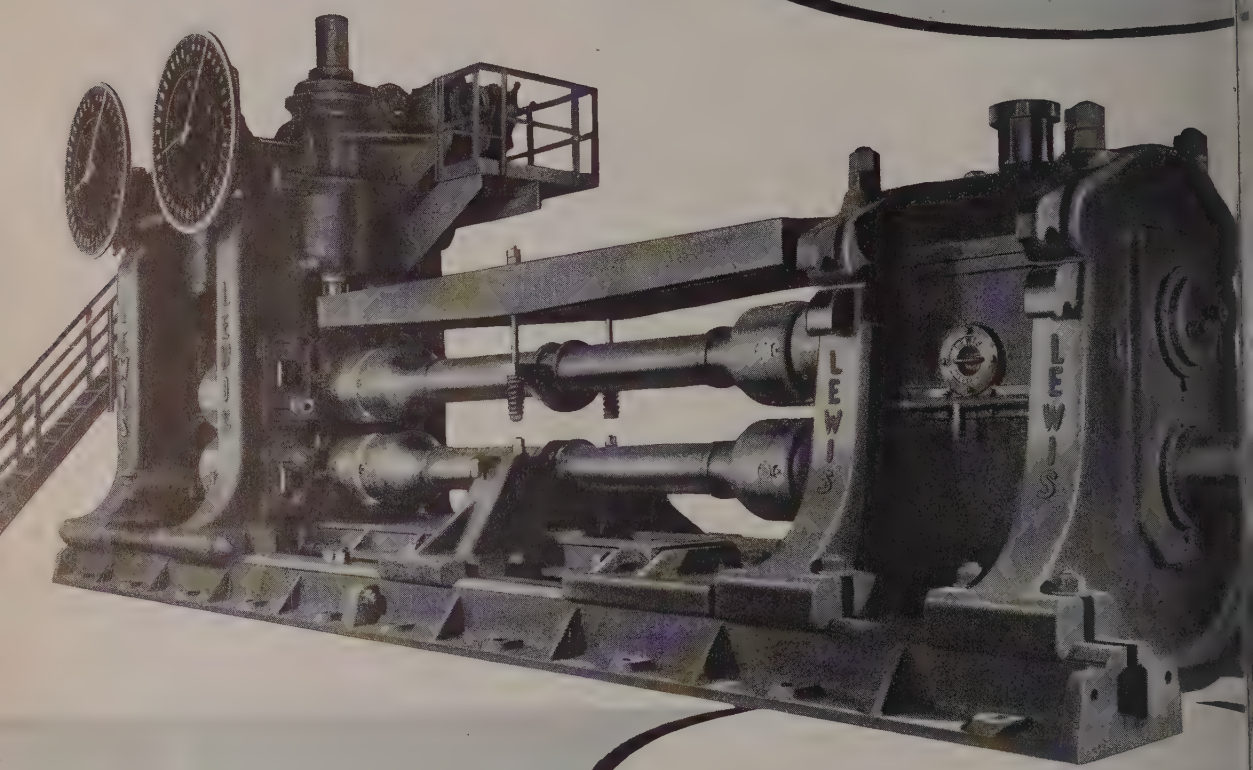
Frank N. Mead, 66, recently in Milwaukee, where he had been sales representative for the Firth-Sterling Steel Co., McKeesport, Pa., 38 years.

♦

James W. Thornton, 58, former Republic Steel Corp. executive, and superintendent of the Lake Erie Steel Co., Cleveland, May 26. After leaving Lake Erie Steel he worked for National Carbon Co. and Union Carbide & Carbon Co.

# LEWIS BLOOMING MI

2 High Reversing
3 High Blooming M




**Rugged Construction**

**Accurate Screwdown**

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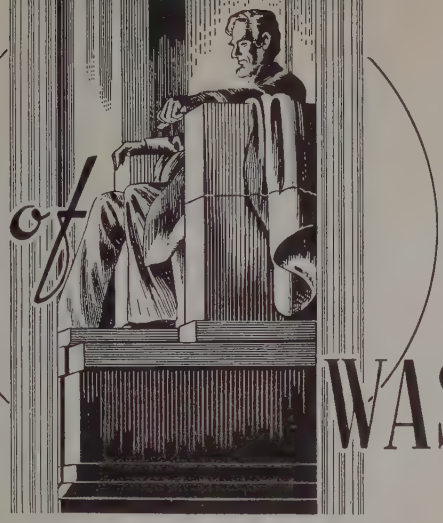
**Lifetime of Economica Production**

LEWIS FOUNDRY & MACH
DIVISION OF BLAW-KNOX CO.
PITTSBURGH PA.

# Windows of WASHINGTON



By L. M. LAMM
ashington Editor, STEEL

*WASHINGTON*

ISE ways and means commit- s reported out a new rev- ill embodying broad tax revi- The proposed changes:

w the undistributed profits tax re Dec. 31, with this new bill e Jan. 1.

ose income tax of 18 per cent porations earning over $25,- nually. Present rates on earn- $25,000 a year or less would ained. These are: First $5000, er cent; $5000 to $20,000, 14 nt; $20,000 to $25,000, 16 per

w corporations to carry over perating business losses for ears. Losses incurred during ar 1939 would be carried over t 1940 profits, and any excess be applied against 1941.

w corporations to increase l stock value in each of next ears, but not decrease it. This permit capital stock value ations to minimize excess tax. Under present law, cor- ons can revalue capital stock up or down in 1941.

**Repeals Deduction Limit**

eal present limit of $2000 de- n for capital losses from cor- on's ordinary income. Long- apital losses—those on capital ver 18 months—to be applied against ordinary income of ation for tax year in which as realized.

porations to be given the treatment as individuals in to short-term capital losses. ks, insurance companies, and ations in territorial posses- to be taxed under the general ions. Their present rate is 16½ nt as these groups are exempt undistributed profits tax.

ual investment companies, receiving this same special ent, to pay 18 per cent tax earnings.

eign corporations engaged in or business in the United States to be taxed 18 per cent, a reduction of 1 per cent.

Corporations in bankruptcy or receivership, joint stock land banks and rental housing corporations, to be treated as all other corporations. They now have a 2½ per cent credit, nullifying the undistributed profits tax.

Under the bill reported out the present excise tax on copper is to be continued until June 30, 1941.

**RECOMMEND $14,250,000 FOR 1940 EDUCATIONAL ORDERS**

House committee on appropriations last week reported a supplemental military appropriation bill for the new fiscal year beginning July 1.

Included is provision of $14,250,000 for "educational orders." It was originally contemplated that $32,500,000 would be appropriated for such orders, but the committee prefers to expend the full amount in two years rather than one.

In its report committee observed regarding educational orders:

"For placing educational orders to familiarize private manufacturing establishments with the production of munitions of war of special or technical design, noncommercial in character, the committee recommends an additional appropriation of $14,250,000 for the fiscal year 1940.

"The act approved April 3 authorizes the appropriation of $42,500,000 for such purpose and expressly provides this sum be spread over fiscal years 1939, 1940 and 1941, with $2,000,000 during each of the next succeeding four fiscal years. A previous measure authorized appropriation of $2,000,000 for educational orders during each of the five years beginning with the fiscal year 1938.

Thus $4,000,000 is already available against the funds the new law contemplates for the fiscal years 1939, 1940 and 1941. Of the remaining amount the committee recommends appropriation of $14,250,000 for the fiscal year 1940, which, in conjunction with the $2,000,000 previously provided, would make available $16,250,000.

"In connection with this plan, sight should not be lost of the unusually large procurement program provided for at the present session, encompassing antiaircraft artillery, semiautomatic rifles, antitank guns, tanks, light and heavy artillery, and ammunition. In addition to about $37,000,000 carried in the 1940 military appropriation act, $110,000,000 in appropriations and contractual authority was made available for such items in the second deficiency appropriation for fiscal year 1939.

"This alone constitutes a tremendous educational program. Approximately 75 per cent of the $110,000,000 is to be spent upon *materiel* procured from industry. That does not mean articles completely manufactured. It means, largely, parts to be used in the fabrication of finished articles in the arsenals.

**Would Revise Procurement**

"If the educational order program is to be continued, committee suggests it may be well to amend the existing law with regard to arsenal production or manufacture, from the standpoint of following up the educational orders with regular production orders. Under present law a 'repeat' educational order may not be placed 'within any period of three successive years,' and under this procedure a follow-up production order is a remote possibility."

In connection with the proposed appropriation for educational orders, Assistant Secretary of the Treasury Louis Johnson, in charge of their allotment, has asked ten leading industrialists to serve as a special advisory committee for handling the orders. Included are: J. L. Perry, president, Carnegie-Illinois Steel Corp.; Frank D. Bell, president,

Edgewater Steel Co.; William Knudsen, president, General Motors Corp.; Charles J. Stilwell, president, Warner & Swasey Co.; Donald W. Douglas, president, Douglas Aircraft Co. Inc.; and William H. Coleman, president, Bucyrus-Erie Co.

### NAM PATENT GROUP VISITS COMMERCE DEPARTMENT

Study of the patent system to determine if there is need for effecting changes to aid industry will be undertaken by a subcommittee on patent procedure of the National Association of Manufacturers.

Personnel of the group has been selected by the association from various manufacturing fields in all sections of the country.

Members of the subcommittee visited the department of commerce last week, discussing their proposed study with Conway P. Coe, commissioner of patents, and other patent officials.

Subjects discussed included the simplification of language of the patent document, especially to make the claims indicate more clearly the scope of the protection; the effect of revisions of the patent system now advocated by the department of commerce; the delays attending procurement of patents, and the procedure for determining priority where an invention is claimed by two or more persons.

The work of the patent office's various units was inspected in an endeavor to become acquainted more completely with the procedures normally employed.

Members who visited the department included: Henry Lanahan, vice chairman of the subcommittee, Thomas A. Edison Inc., West Orange, N. J.; H. G. Donham, vice president, United Shoe Machinery Corp., Boston; H. R. Doty, Hugh H. Eby Inc., Philadelphia; George E. Folk, special patent advisor, committee on patents and trade marks of the National Association of Manufacturers; J. A. Holton, Underwood Elliott Fisher Mfg. Co., New York; R. T. Moore, Consolidated Packaging Machinery Corp., Buffalo; Joseph Rossman, patent attorney, Marathon Paper Mills Co., Rothschild, Wis.; E. A. Terrell, president, Terrell Machine Co., Charlotte, N. C.; R. J. Wean, president, The Wean Engineering Co., Warren, O., and R. J. Dearborn, patent counsel, Texas Co., New York.

### HOUSE COMMITTEE REPORTS NEUTRALITY RESOLUTION

House foreign affairs committee last week favorably reported a neutrality resolution sponsored by the administration.

It contains provisions of the act of May 1, 1937, respecting loans and credits to nations at war; the solicitation and collection of funds for nations at war; the use of American ports as a base of supply; the regulation of the use of our ports by foreign submarines and armed merchant vessels; and the prohibition of the arming of American vessels engaged in commerce with nations at war. It also provides for the continuation of the national munitions control board and the system of arms export and import licenses. The resolution does not provide an embargo on any class of goods; it does stipulate the export of all classes of goods destined for nations at war be preceded by the transfer of title to the foreign purchaser.

### APPROVE FUNDS FOR HOPKIN'S NEW BUSINESS ADVISERS

Senate last week passed commerce department's appropriation bill for the fiscal year 1940. Included is an appropriation of $255,000 requested by Secretary Hopkins for salaries and expenses for additional business advisers.

This item was not included in the bill as it passed the house, but its appropriation was subsequently recommended by President Roosevelt.

The senate tied Hopkins up in a manner not to his liking. As the bill passed the senate, the $255,000 appropriation carries a specification that any person employed at a salary of $5000 or over under this appropriation must be appointed by the President and ratified by the senate. This is not at all what Hopkins wanted, and an effort is being made in conference to have the provision stricken from the bill.

Hopkins appeared before the senate appropriations committee to ask for this appropriation, explaining he needed more expert advice. "Thorough study," said Hopkins, "has convinced me of the need for an executive staff to implement the work of the department if we are to meet the demands being made on us by business and industry and fulfill the expectations of the President and the nation.

"When the President asked me to take the post of secretary of commerce he pointed out that the course of events since 1933, and the great number of new statutes affecting business, had created a need for a completely new function for the department. That need, as he saw it, was to make sure that the objectives of the administration's program for reforms in our business structure were carried out with the utmost technical skill so that we should have no more disturbance of business than was absolutely necessary to attain these accepted objectives.

"This purpose calls for a new kind of ability and a new kind o in the department of c quite different from that w been required to carry out mal administrative functio old department. It is a which I feel sure will mee proval of every member of who is convinced, as I am, t ing business will help the

### EQUIPMENT LOANS TO R STUDIED BY ADMINISTR

Loans to the railroads equipment are now being by the government, it was by President Roosevelt at h conference Friday.

Two plans are under co tion, one being direct loan roads, the other the build leasing of equipment with ernment holding title. Th Mr. Roosevelt stated, would the creation of a new gov agency.

### TO SAVE $1,710,000,000 BY SECURITY ACT CHAN

By an overwhelming v house has approved social act amendments which it tended will save employers 000,000. Old age pension tax frozen at its present rate ir being increased on Jan. 1, originally provided. The finance committee last we hearings on the bill, and it i gone conclusion that the will be affirmed.

As it passed the house, moves the effective date of pensions up to Jan. 1, 19 tax relief provided is due t to stepup the old age i rate for another three years permitting states with adeq serves to scale down unemp insurance taxes exacted fr ployers.

The bill abandons the orig to build up a $47,000,000,00 fund and substitutes a co reserve system that would r above $7,752,000,000 in the years.

### GOVERNMENT IRON, ST AWARDS TOTAL $363,796

During the week ended the government purchased steel products costing $3 under the Walsh-Healey ac lows: Messinger Bearings I adelphia, $58,828; Warren & Pipe Corp., New York, $2 J. B. Slattery & Bros. Inc lyn, N. Y., $67,791; Welbi ance Corp., Maspeth, L. 713.25; American Bridge C ver, $70,245; Bethlehem S port Corp., New York, $ and Stupp Bros. Bridge & St. Louis, $62,019.40.

# ATION

**) GET $187,000,000**
**DITIONAL PLANES**

ARY aircraft costing $187,- e to be purchased by war t under the deficiency bill e the house.

g about 2290 new planes, re would bring the army fighting strength to 5500 e units by July 1, 1941. ided is a $5,000,000 supple- propriation for aeronauti- ch in 1940.

tual contracts for airplanes were allotted by the gov- ast week. To Seversky Air- ., Farmingdale, L. I., went rder for 13 all-metal mon- sting $974,324.

Aircraft Corp., Troy, O., order from the army for training craft amounting . This company also signed 0 contract to build seven es for civil aeronautics au- Others receiving training rs were St. Louis Aircraft Louis, and Ryan Aeronau- San Diego.

for engines and accessor- ss-Wright Corp., New York, eous parts, $1,117,811; viation division of Bendix Corp., Bendix, N. J., start- witches, $441,056; Pratt & division of United Aircraft st Hartford, Conn., engines, and parts, $28,056; Pump Engineering Service Corp., Cleveland, pump assemblies, $69,093; Pioneer Instrument Co. Inc., Bendix, N. J., oxygen regulators, $52,325; and Leece-Neville Co., Cleveland, generators, $34,440.

Beech Aircraft Corp., Wichita, Kans., has registered with SEC its intention to issue 100,000 additional shares of common stock, part of the proceeds going into machinery and other production equipment.

Contracts have been placed by Wright Aeronautical Corp., Paterson, N. J., for building a one-story addition to its assembly plant, and a 78-foot steel bridge between two factory units. Architect is Albert Kahn Inc., Detroit.

Aluminum Co. of Canada Ltd., Montreal, is ready to start constructing at Kingston, Ont., a plant to produce aluminum sheets for airplanes. Total cost with equipment is estimated at $500,000.

**New Aircraft Builders**

Capitalized at $1,000,000, General Aircraft Corp. has just been organized in Los Angeles and proposes manufacturing operations. Ralph A. Beal, Los Angeles, is a director. Also newly-formed is North Pacific Aircraft Corp., Seattle, planning to produce a new type twin-engined lightplane. Company's representative is George Yates, Seattle.

A broad program for training factory apprentices was launched last week by Lockheed Aircraft. Apprentices 18 to 23 years of age will work and study during a 4-year period in the firm's Burbank, Calif., plant. Compensation will approximate one-half the prevailing scale for journeymen.

American Magnesium Corp., Cleveland, has completed a new sand foundry in Los Angeles, will supply magnesium alloys to western airplane builders. It is said the aircraft industry today consumes 60 per cent of all fabricated magnesium alloys.

## lying Model Shows Bomber's Performance

Glenn L. Martin Co.'s new navy patrol bomber would perform was ated before its construction by an exact quarter-scale, man-carrying fly- el, the first of its kind ever built. Gull-winged, the big ship is all-metal, weighs 18 tons, carries crew of seven

## 140 Attend Baltimore Steel Club Outing

■ Steel Club of Baltimore's fourth annual golfing party June 9 at the Rolling Road golf club was attended by 140 members and guests, many of the latter from distant cities.

C. H. Michel, Maryland Metal Building Co., and club president, presented to Past President Charles S. Duvall, Maryland Bolt & Nut Co., a plaque in recognition of his services to the club.

Harry A. Robowtham, Belmont Iron Works, Philadelphia, had low gross in the golf tournament. George H. French, Maryland Dry Dock Co., had low net. Following Mr. French were J. A. Doyle Jr., Jones & Laughlin Steel Corp.; Henry Heine, Hudson Supply & Equipment Co., Washington; Charles A. Lynn, E. I. du Pont de Nemours, Philadelphia; and Dan Brierly, American Bureau of Shipping. Robert Price, Southern Supply Co., won a special golf trophy.

Arrangements committee: Charles W. Test, Youngstown Sheet & Tube Co., chairman; Frank Carter, Maryland Dry Dock Co.; W. D. Bourquin, Republic Steel Corp.; J. B. Coster, Bethlehem Steel Co.; H. R. Dorney, Jones & Laughlin Steel Corp.; and G. H. Mackelcan, American Steel & Wire Co.

## Pangborns Give Public Park to Hagerstown

■ Pangborn public park, presented to Hagerstown, Md., by Thomas W. Pangborn, president, and John C. Pangborn, vice president, Pangborn Corp., manufacturer of foundry equipment, was dedicated June 10. State and city officials participated in the exercises.

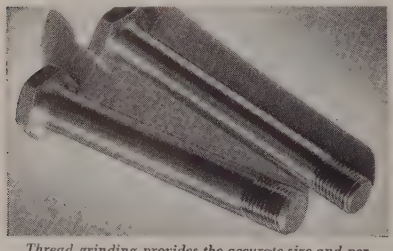
The park, consisting of 7½ acres, given by the Pangborn brothers, has been landscaped and equipped by the city. In addition to gardens, a lake and other ornaments, baseball diamonds, tennis courts and playgrounds have been provided. Tables and stoves in a grove serve picnickers.

# IT STARTED IN THE AIRCRAFT INDUSTRY WITH CYLINDER STUDS!

## *Now grinding is top ranking production method for generating threaded parts*

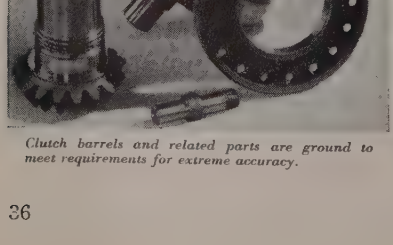
HOW can we put better, stronger threads on our highly stressed cylinder studs? That was the cry of the aircraft industry only a few years ago. They had already reached the absolute limit of accuracy and dependability in generating threaded sections by the old methods.

The answer was thread grinding! With the introduction of accurate and efficient machines in 1935, it became possible for the first time to generate cylinder stud screw threads from the blank by grinding . . . on a production basis. Previous to this, thread grinding had been an obscure process used only for the correction of screw threads.



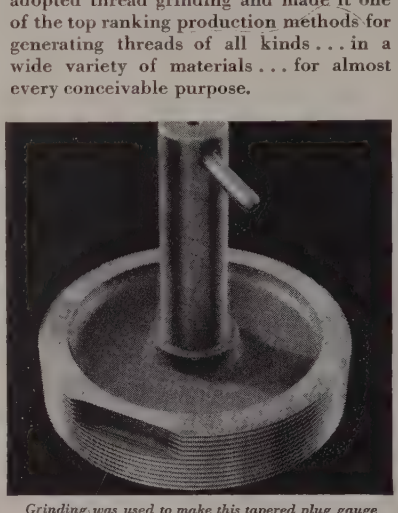
*Thread grinding provides the accurate size and perfect finish necessary for the high factor of safety required in aircraft engine parts such as these rocker arm bolts.*

The result of grinding the cylinder stud threads was a vast improvement in accuracy and dependability . . . at a surprisingly low cost. The new method was so sensationally successful that its use was soon extended by aircraft manufacturers to practically all threads on external surfaces, and to internal surfaces where size would permit.



*Clutch barrels and related parts are ground to meet requirements for extreme accuracy.*

Manufacturers in other fields were not slow to fall in line. They have eagerly adopted thread grinding and made it one of the top ranking production methods for generating threads of all kinds . . . in a wide variety of materials . . . for almost every conceivable purpose.



*Grinding was used to make this tapered plug gauge for internal pipe threads.*

### *Thread grinding has many advantages*

No wonder thread grinding was enthusiastically received. It gives a highly accurate thread section, with a smoother, better finish and appearance. The thread is stronger and more dependable. There is almost a complete absence of checks and cracks. And because the grinding is done after heat treating, the threads are unusually hard and wear resistant.

These advantages are gained with no sacrifice in economy. Production is rapid and the cost low. For a given degree of accuracy, many thread pitches may be produced from the blank in a fraction of the time required to mill or turn the same threads. No special skill or experience is required by the operator.

### *Any material can be threaded by grinding*

Any material, metallic or non-metallic, which can be ground can also be threaded by means of special thread grinding wheels and thread grinding machines. The advantages of the process are particularly outstanding on the threading of corrosion, heat and abrasion resisting alloy steels;

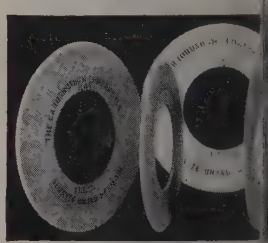
*Thread grinding is simple. Accura secured without experienced operat*

and on those materials with al ties like hard rubber, hard baked carbon, and moulding (especially those containing mica dust).

### *Correct grinding wheels for best results*

As in all precision grinding, t right wheel is of paramount i thread grinding. Even befor ance on the market of thread chines for production work, C had discovered and introduce types of specially bonded th wheels. This availability of su had a great deal to do with th success of thread grinding tion basis.

Adequate stocks of uniform Carborundum-made thread gr are carried at all times, to thread grinding requirement threads per inch. And Carbor

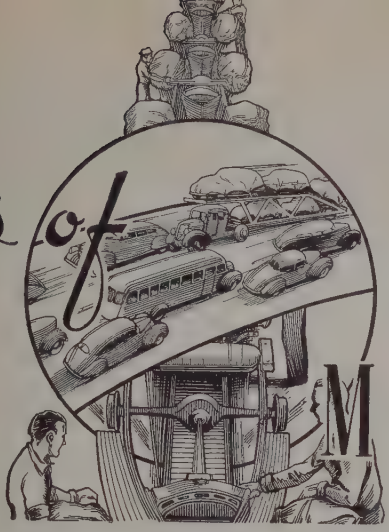


*Strong, accurate threads are grou Brand Resinoid and "AA" Aloxite Wheels manufactured by The Carbor*

experience in thread grindi at once to any manufacturer ested in a further investigat vantages of this revolutio Inquiries will be welcome of The Carborundum Compa


CARBORUNI
ABRASIVE PRO
THE CARBORUNDUM C
REG. U. S. PAT. OFF.
*Niagara Falls, N.*
Sales Offices and Warehouses in Chicago, Philadelphia, Detroit Boston, Pittsburgh, Cincinnati, C
Carborundum and Aloxite are trade-marks of The Carborundum

# Mirrors of MOTORDOM



By **A. H. ALLEN**
Detroit Editor, STEEL

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*DETROIT*

RP impetus to activity on odels was reported in this week by vendors of a wide f materials and parts, some om received the largest s of prospective new business al years. Much of this, of is only in the inquiry or uring stage, but indications t a considerable volume of ations have been released neering departments, and or- ould be out soon.

three-week delay in Briggs ns as a result of a strike y held up release of specifi- on new model parts from rce, and resumption of ac- n the 1940 Chrysler body s been one factor in improv- outlook for suppliers.

r Body plants are practically capacity on work for the neral Motors lines, and some being transferred to outside o relieve the pressure.

dark cloud of labor unrest, r, glooms the picture and at ment might break out into howers. Latest move of the ion is to issue demands for lemental contract for 1800 kers and skilled workers in Motors plants now busy on rograms. The corporation ken the position it cannot bly enter into negotiations ny union group until the or the NLRB determine r the CIO or AFL unions are gents to represent workmen.

ntly, Walter P. Reuther, di- of the General Motors union rs allied with the CIO, has "If William Knudsen insists ly the courts can decide who peak for the GM workers, we compelled to tell him to see courts can make his tools and

union has compiled a long list of demands for tool and die workers, including a clause permitting the placing of a union label on tools and dies and pledging the company to use only tools bearing this label.

This recalls demands made at the time of the 1937 strikes here when the UAW proposed union labels for nearly everything going into an automobile, including steel. Under such an arrangement a union workman would have refused to handle any part or any material which did not carry such a label, thereby forcing the unionization of all the companies supplying the auto industry. Naturally the demand was never given a moment's consideration.

Effort of Homer Martin to close the Fisher and Chevrolet plants in Flint last week flopped miserably. Figures tell the story. At Fisher No. 1 plant, out of a total force of 2990, company records show 724 absent Monday, 360 on Tuesday and only 174 Wednesday. At the Chevrolet plants, out of a total force of

## From Toledo to Europe—by Water

■ **Norwegian steamship BENCAS is being loaded with Willys-Overland cars at a dock in Toledo, O., for shipment to various points in Sweden. Ocean-going vessels make their way to Great Lakes ports by way of the St. Lawrence and the Welland canal. Direct shipment to foreign markets permits Willys to lower price tags on merchandise at these points, according to R. J. Archer, manager of Willys Export Corp.**

6900, only 430 were out on Monday, 368 on Tuesday and 170 on Wednesday. At the Chevrolet foundry in Saginaw, employing 2700, absentees Monday numbered 600, and by Wednesday practically the entire force was at work.

Sensing the unwillingness of his followers to join picket lines, Martin then tried to enlist the aid of the AFL teamsters' union by asking them to refuse to haul materials into the plants. At first, this was agreed upon, but Tuesday the order was countermanded by AFL headquarters. Martin's followers then turned to staging regular attacks on CIO workmen outside the plants and also on CIO headquarters in Flint.

Union members, on Martin's recommendation, voted Wednesday night to call off the strike. This followed a promise the strikers would not be discriminated against.

Releases of 1940 model steel tonnages have not been made in any volume, although Buick has released one lot for 10,000 cars. All large consumers in this territory are covered at the lower prices prevailing a few weeks ago, and it is believed that even Ford, who professed at the time to have booked only a small fill-in tonnage "at a price," has tacitly covered steel requirements over the balance of the year.

■ REPORT of federal trade commission on the automotive industry shows some interesting figures on profit performance in the years 1929-37. General Motors divisions made average net profit of 24.85 per cent on dollar sales of parts and accessories, 7.18 per cent on new car sales; Chrysler showed 17.3 per cent profit on accessories, 6.6 per cent on new cars; and Ford made 12.07 per cent on accessories, lost 0.36 per cent on new car sales.

The commission did not explain how the Ford percentages were determined and since the company issues no financial statement comparable with other companies the figures may be questionable. If accurate, however, they show that for every $100 worth of new cars sold, Ford has turned back $100.36 into plant, equipment and returns to the owners. The latter is the unknown figure, but with only three owners it is safe to say the bulk of the income was reinvested in plants.

Investments in new plants in general throughout the automotive and allied industries do not show any pronounced improvement. Chrysler has announced approval of appropriation for doubling the size of its present engineering laboratories, but no start has been made on the project. Electric Auto-Lite Co. at Toledo, O., soon will begin construction of a new plant, location and purpose not yet known. Cleveland Graphite Bronze Co., supplier of large quantities of automotive bearings, also will undertake construction of a new plant in the near future.

■ OF CONSIDERABLE interest to the metals industries is an experimental project now under way at the Ford plant, involving the production of ball bearing assemblies of cast steel. Both the balls themselves and inner and outer races are cast of a steel corresponding to the Ford BB analysis, and the assembly is complete with a couple of stampings for certain retainers.

Ford engineers minimize the importance of this development, stating that balls for bearings have been cast for ten years, and that the casting of bearing races was a natural outgrowth of the work done on centrifugal casting of gears, now a production operation. No equipment has been purchased for casting these bearing assemblies, those machines which have been built coming from equipment already available. As yet no plans have been divulged for putting such bearings on a production basis, but in the light of success already achieved with centrifugal casting it would appear that they have possibilities for the future.

Another development in the castings field is reported to b at Kelsey-Hayes Wheel Equipment has been de is now in process of bu the manufacture of comp and iron brake drums by ugal process. Two rockin tric furnaces have been o duplexing cupola iron v then be fed into spinners on the inner side of pr backings. This project sti preliminary stage altho ported expenditure of $2 equipment will be made.

Similar types of drum duced by the Centrifugal in Lansing, Mich., and ar a number of makes of a currently. The fact that initiating production of su lends credence to the re of the large-scale produ switch to the composite c ly cast drum for 1940 mo

## Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

| | 1937 | 1938 | 1939 |
|---|---|---|---|
| Jan..... | 399,186 | 227,130 | 353,946 |
| Feb..... | 383,900 | 202,589 | 312,141 |
| March.... | 519,022 | 238,598 | 389,489 |
| April.... | 553,231 | 238,133 | 354,263 |
| May..... | 540,377 | 210,183 | *306,000 |
| 5 mos. .. | 2,395,716 | 1,116,658 | *1,715,839 |
| June..... | 521,153 | 189,399 | ..... |
| July..... | 456,909 | 150,444 | ..... |
| Aug..... | 405,072 | 96,936 | ..... |
| Sept..... | 175,630 | 89,623 | ..... |
| Oct..... | 337,979 | 215,296 | ..... |
| Nov..... | 376,629 | 390,350 | ..... |
| Dec..... | 347,349 | 407,016 | ..... |
| Year ..... | 5,016,437 | 2,655,777 | ..... |

*Estimated.

Estimated by *Ward's Reports*

| Week ended: | 1939 | 1938† |
|---|---|---|
| May 20 ..... | 80,145 | 46,810 |
| May 27 ..... | 67,740 | 45,120 |
| June 3 ..... | 32,445 | 26,980 |
| June 10 ..... | ‡65,265 | 40,175 |
| June 17 ..... | 78,305 | 41,790 |

†Comparable week.

| | Week Ended June 17 | Week Ended June 10 |
|---|---|---|
| General Motors ..... | 31,910 | 30,650 |
| Chrysler ..... | 22,900 | ‡8,145 |
| Ford ..... | 15,500 | ‡17,600 |
| All others ..... | 7,995 | 8,820 |

‡Revised.

## Metallurgy, Econo On Founders' Pro

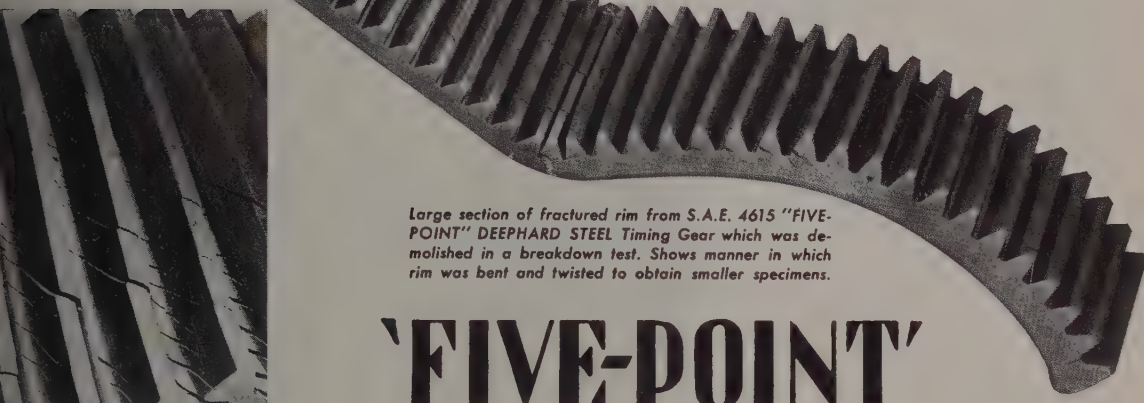
■ Malleable Founders' Cleveland, will hold it meeting June 23-24 at ter Country club, Rye, technical session will be morning, with afternoons nings devoted to social e nual dinner guest speaker Rogers, American Founda York, will discuss, "Nec Understanding Men, and We Go from Here."

The Friday morning se be addressed by James H the society's shop practice on results of the sand s the summer technical course; Leon J. Wise, Malleable Castings Co., on and product improvement Wagner, Wagner Malle Co., Decatur, Ill., on revis cost manual; Anthony Has ton Malleable Iron Co., D on hourly earnings and week. The guest speaker a sion will be Stanley A. K rector of advertising, Rep Corp., Cleveland, on Sales Promotion."

Saturday's morning se hear discussion by Enrique the society's consulting en action of lead on malleabl fect of phosphorus at sub peratures and specific valu sile properties. Federal l and the Washington situ be discussed by Arthur F. Michigan Malleable Iron troit, and Robert E. Belt ciety's secretary. Publicity ket developments will be by E. E. Griest, Fort Pitt Iron Co., Pittsburgh, and Cawthon Jr., development of the society.

# ARD-SURFACE TOUGH-CORE *perfectly joined in*

*Teeth twisted .040" out of line with no sign of cracking or spalling. Solid black lines show original alignment of teeth before twisting.*



*Large section of fractured rim from S.A.E. 4615 "FIVE-POINT" DEEPHARD STEEL Timing Gear which was demolished in a breakdown test. Shows manner in which rim was bent and twisted to obtain smaller specimens.*

*penetration of every fracture into gh the core without evidence of d spalling.*

IXL
IVE-POINT'
*Deephard*
STEEL

# 'FIVE-POINT' *Deephard* STEEL

HERE is convincing proof of the remarkable fusion of the wearing surface hardness with the core — and of core ductility and toughness — that are found in all "FIVE-POINT" DEEPHARD STEEL products. The section of fractured rim illustrated above clearly shows the value of this ductility and toughness, and gradual and even fusion between surface hardness and core — without these qualities the teeth of this gear could not have withstood such distortion before fracturing . . . note that the fractures go into and completely through the core without flaking and spalling.

"FIVE-POINT" DEEPHARD STEEL *can be used and will do a better job wherever there is a problem of combating abrasive surface wear, shock and fatigue. It is a "hard surface" steel that is one "solid piece"— not a two-layer steel having a case and core.*

## "FIVE-POINT" SUPERIORITY

1. Increased hardness in wearing surface without fear of spalling or flaking.
2. Complete control of and greater depth to this hardness.
3. Gradual and even fusion of wearing surface with core.
4. Higher core area physical properties.
5. Metallurgically the finest grain structure throughout for wear, fatigue, and shock resistance.

oday for catalog on "FIVE-" DEEPHARD STEEL. Our ering department is at service in adapting this r product to your prob- f wear-life and strength.

OTE BROS. GEAR AND MACHINE CORPORATION
OUTH WESTERN BOULEVARD — CHICAGO, ILLINOIS

# Editorial

## *Trend Is Toward Curbs on Labor Abuses*

■ UNDER a normal concept of life everybody has to work to earn a living. The general process by which everybody works to earn a living, through rendering services of vast variety, constitutes the composite fabric known as "business." Hence, any factor that hampers or discourages business immediately becomes important to the average citizen because it affects his ability to earn a living. The average citizen is not always quick to realize the full significance of such factors. When he does finally come to a realization and forms a positive impression as to what kind of a cure should be applied, action is not long in coming.

There have been many indications during the past year that the average citizen is not satisfied with the present condition of business. He realizes that current conditions are such as to handicap business and make it difficult for him to earn a living.

### Corrective Measures Appear First Where Unions Were Liberally Treated

There are indications that the average citizen has progressed in considerable degree toward a realization that business has to be conducted at a profit if it is to be healthy and provide employment in desired volume. The trouble is that the average citizen is confused as to the correctives that should be applied and that political officeholders, therefore, are more inclined to listen to organized pressure groups with selfish interests. But in the long run the will of the average citizen is bound to prevail.

One of the reassuring manifestations at this time is the growing impatience on the part of the average citizen over domineering and destructive tactics of some labor organizations. They take the form (STEEL, May 15, page 23) of state and local legislation that limit picketing, restrict strike action and curb other activities. The most drastic restraints, significantly, have been imposed by those states noted earlier for liberal treatment of labor unions. Farmers have played an important role in initiating and supporting anti-union laws. These laws and ordinances have resulted in the main not from "legitimate" union activities concerned with wages, hours and working conditions, but with abuses of power by union leaders.

### Tide of Regulation Spreads As Sounder Thinking Prevails

Oregon, Minnesota, Oklahoma, Wisconsin and Pennsylvania are the states that so far have enacted such legislation. Attempts to pass similar legislation in California and Washington lost by small margins. Restrictive bills now are pending in 9 other states. Los Angeles, Flint, Mich., and some other small cities and rural counties have adopted ordinances that regulate union activities. In contrast, not a single one of the "little Wagner acts" introduced in various state legislatures has been passed and only one state, New Mexico, has enacted an anti-injunction measure.

It may take a long time for the average citizen to discover the exact nature of deterrents to business and do something about them. But in the long run he can take care of himself. There is reason for confidence that ultimately will come a complete reversal from the unsound thinking that has been so large a factor in blighting the average citizen's earning power through recent years.

# The BUSINESS TREND

## ex of Activity Rebounds

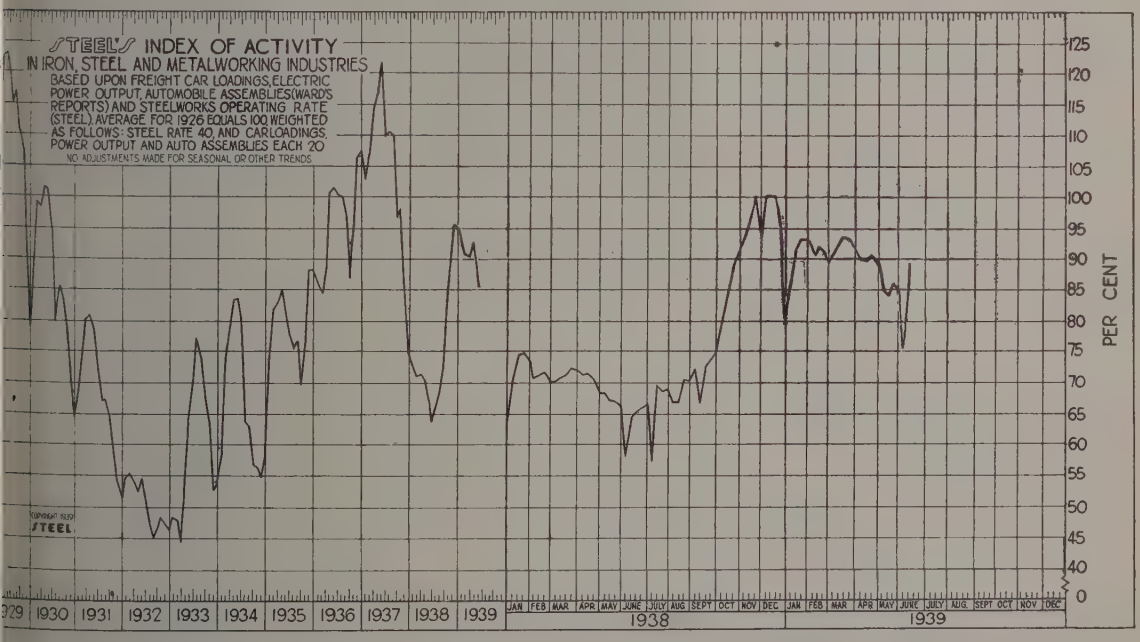
## rply After Holiday Week

rebound of industrial activity from the holiday s gone far in bolstering the confidence of many il leaders. Activity in the iron, steel and metal- industries as recorded by STEEL'S index not ained all the ground lost in the Memorial day it is also at the highest level since the week pril 29.

dex now stands at 88.2, a gain of 12.3 points preceding week. In the comparable week last year the index stood at 64.4. All of the four business indicators composing the index registered encouraging gains in the latest week.

Steelmaking operations recorded the third consecutive weekly increase to 53.5 per cent. This recent advance represents a total increase of 8 points since the low point this year of 45.5 per cent registered in the week ended May 20. Current indications point to a leveling off in steelmaking operations through the remainder of this quarter.

Renewal of the regular schedules after the holiday week, together with the settlement of the Briggs strike acted jointly in restoring automobile schedules to the 65,000-car level in the week ended June 10. Total output in that week of 65,265 units more than doubled the Memorial week volume of 32,445 and remains well above the comparable week last year of 40,175. The reopened




*STEEL'S index of activity gained* 12.3 *points to* 88.2 *per cent in the week ended June* 10:

| ling | 1939 | 1938 |
|---|---|---|
| ..... | 93.2 | 72.4 |
| ..... | 92.2 | 72.0 |
| ..... | 90.0 | 71.3 |
| ..... | 89.7 | 71.4 |
| ..... | 90.4 | 70.8 |
| ..... | 89.2 | 68.4 |
| ..... | 85.1 | 68.5 |
| ..... | 84.2 | 67.2 |
| ..... | 86.6 | 67.1 |
| ..... | 85.4 | 66.5 |
| ..... | 75.9 | 58.1 |
| ..... | 88.2 | 64.4 |

| Mo. Data | 1939 | 1938 | 1937 | 1936 | 1935 | 1934 | 1933 | 1932 | 1931 | 1930 | 1929 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan..... | 91.1 | 73.3 | 102.9 | 85.9 | 74.2 | 58.8 | 48.6 | 54.6 | 69.1 | 87.6 | 104.1 |
| Feb..... | 90.8 | 71.1 | 106.8 | 84.3 | 82.0 | 73.9 | 48.2 | 55.3 | 75.5 | 99.2 | 111.2 |
| March..... | 92.6 | 71.2 | 114.4 | 88.7 | 83.1 | 78.9 | 44.5 | 54.2 | 80.4 | 98.6 | 114.0 |
| April..... | 89.8 | 70.8 | 116.6 | 100.8 | 85.0 | 83.6 | 52.4 | 52.8 | 81.0 | 101.7 | 122.5 |
| May..... | 85.3 | 67.4 | 121.7 | 101.8 | 81.8 | 83.7 | 63.5 | 54.8 | 78.6 | 101.2 | 122.9 |
| June..... | .... | 63.4 | 109.9 | 100.3 | 77.4 | 80.6 | 70.3 | 51.4 | 72.1 | 95.8 | 120.3 |
| July..... | .... | 66.2 | 110.4 | 100.1 | 75.3 | 63.7 | 77.1 | 47.1 | 67.3 | 79.9 | 115.2 |
| Aug..... | .... | 68.7 | 110.0 | 97.1 | 76.7 | 63.0 | 74.1 | 45.0 | 67.4 | 85.4 | 116.9 |
| Sept..... | .... | 72.5 | 96.8 | 86.7 | 69.7 | 56.9 | 68.0 | 46.5 | 64.3 | 83.7 | 110.8 |
| Oct..... | .... | 83.6 | 98.1 | 94.8 | 77.0 | 56.4 | 63.1 | 48.4 | 59.2 | 78.8 | 107.1 |
| Nov..... | .... | 95.9 | 84.1 | 106.4 | 88.1 | 54.9 | 52.8 | 47.5 | 54.4 | 71.0 | 92.2 |
| Dec..... | .... | 95.1 | 74.7 | 107.6 | 88.2 | 58.9 | 54.0 | 46.2 | 51.3 | 64.3 | 78.3 |

Ford plants were the largest factor in the advance, but nearly all assembly lines were moving at a quickened tempo. May retail car deliveries were encouraging and in at least one instance exceeded that of April. Field stocks which were somewhat out of line at the end of April have been reduced to more normal levels as a result of the contra-seasonal delivery rise during May.

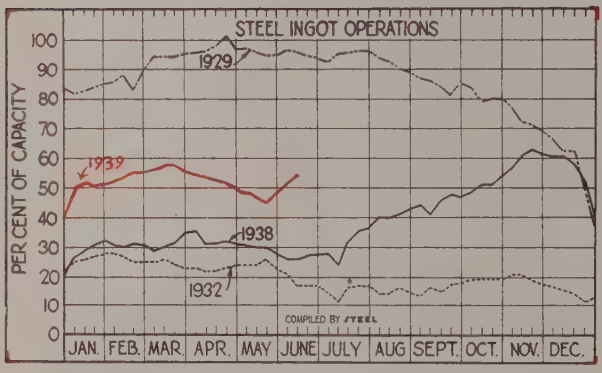
Electric power output in the week ended June 10 advanced to the highest level since the middle of February. Power consumption in latest week of 2,256,823,000 kilowatt-hours compares with 2,113,887,000 in the holiday week. Revenue freight carloadings increased to 634,597 cars in the week ended June 10, thus regaining the loss incurred in the preceding week. In fact the latest advance forced this important business indicator to a new high for the year.

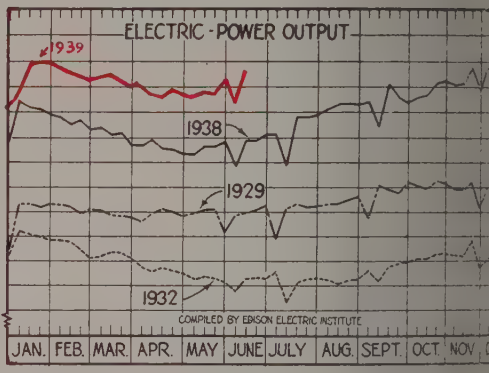
### MAY INGOT OUTPUT DECLINES

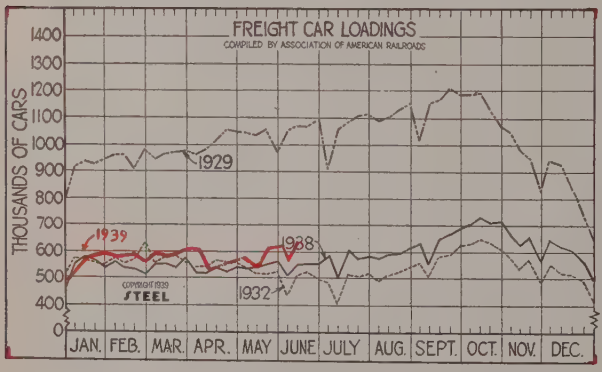
The daily average ingot production during May was 108,069 gross tons, based on the total output for the month of 2,917,876 gross tons reported by the American Iron and Steel institute. This compares with a daily average of 119,479 in April and 72,272 tons 1938. Ingot operations last month averaged cent of capacity, lowest rate this year, compa 50.99 in April and 30.30 per cent in May of For the five months this year ingot productio 15,499,546 tons, or an increase of 69.3 per cent 9,155,740 tons of ingots produced in the compa riod last year.

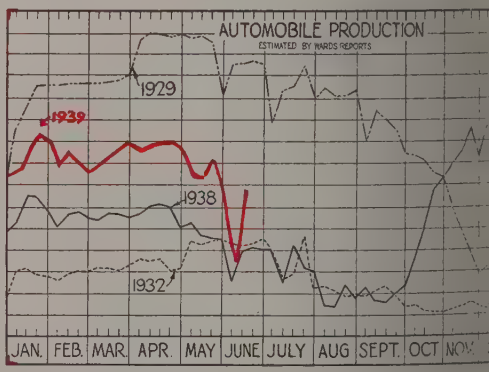
### MACHINE TOOL INDEX IN SHARP GAIN

The monthly orders index of National Mac Builders' association during May advanced to est level since April, 1937. Renewed forwa in both domestic and foreign orders in Ma the monthly index to 219.8, a gain of 64.2 p the preceding month. At this point the index the average range for 1937. The three month average index of orders recorded the sixth c monthly increase during May to 186.9, up sub from the 169.4 level in April and is more th the 88.0 registered by the index in May, 1 three months moving average index is at th level since November, 1937.

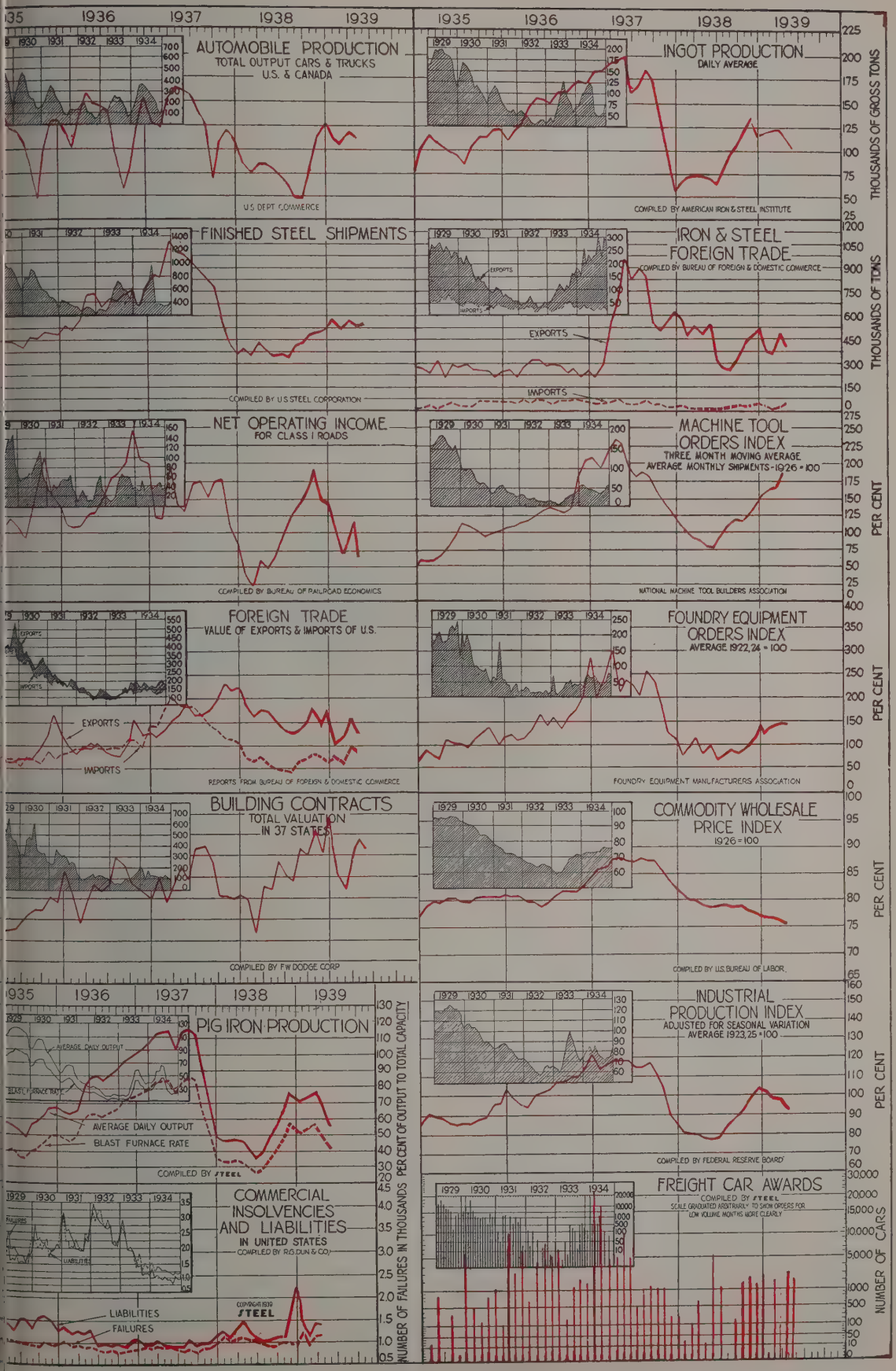



| Week ending | Steelworks Operating Rate Per Cent 1939 | 1938 | 1932 | 1929 | Electric Power Output Million KWH 1939 | 1938 | 1932 | Freight Car Loadings Thousands of Cars 1929 | 1939 | 1938 | 1932 | Weekly Au Output 1929 | 1939 | 1938 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb. 18 | 55.0 | 31.0 | 25.0 | 88.0 | 2,249 | 2,059 | 1,545 | 1,718 | 580 | 536 | 572 | 958 | 79,860 | 59,100 | 30,4 |
| Feb. 25 | 55.0 | 30.5 | 25.0 | 83.0 | 2,226 | 2,031 | 1,512 | 1,699 | 561 | 512 | 636 | 907 | 75,660 | 56,977 | 30,1 |
| Mar. 4 | 56.0 | 29.5 | 25.0 | 89.5 | 2,244 | 2,036 | 1,519 | 1,707 | 599 | 553 | 560 | 977 | 78,705 | 54,440 | 31,3 |
| Mar. 11 | 56.5 | 30.0 | 25.5 | 94.5 | 2,238 | 2,015 | 1,538 | 1,703 | 592 | 557 | 575 | 946 | 84,095 | 57,438 | 31,1 |
| Mar. 18 | 56.5 | 32.0 | 24.5 | 94.5 | 2,225 | 2,018 | 1,537 | 1,687 | 594 | 540 | 585 | 958 | 86,725 | 57,558 | 30,3 |
| Mar. 25 | 55.5 | 35.0 | 23.0 | 94.5 | 2,199 | 1,975 | 1,514 | 1,683 | 605 | 573 | 561 | 961 | 89,400 | 56,800 | 32,3 |
| Apr. 1 | 54.5 | 36.0 | 23.0 | 95.0 | 1,210 | 1,979 | 1,480 | 1,680 | 604 | 523 | 545 | 967 | 85,980 | 57,500 | 35,7 |
| Apr. 8 | 53.5 | 32.0 | 22.0 | 95.5 | 2,173 | 1,990 | 1,465 | 1,663 | 535 | 522 | 545 | 956 | 87,019 | 60,975 | 35,3 |
| Apr. 15 | 51.5 | 32.0 | 22.0 | 96.0 | 2,171 | 1,958 | 1,480 | 1,697 | 548 | 538 | 567 | 972 | 88,050 | 62,021 | 35,7 |
| Apr. 22 | 50.5 | 32.5 | 23.0 | 98.0 | 2,199 | 1,951 | 1,469 | 1,709 | 559 | 524 | 562 | 1,004 | 90,280 | 60,563 | 30,0 |
| Apr. 29 | 49.0 | 32.0 | 24.0 | 101.0 | 2,183 | 1,939 | 1,445 | 1,700 | 586 | 543 | 554 | 1,052 | 86,640 | 50,755 | 31,1 |
| May 6 | 49.0 | 31.0 | 24.0 | 97.0 | 2,164 | 1,939 | 1,429 | 1,688 | 573 | 536 | 534 | 1,050 | 71,420 | 53,385 | 43,7 |
| May 13 | 47.0 | 30.0 | 24.0 | 97.0 | 2,171 | 1,968 | 1,436 | 1,698 | 555 | 542 | 517 | 1,048 | 72,375 | 47,415 | 42,7 |
| May 20 | 45.5 | 30.0 | 25.5 | 96.0 | 2,170 | 1,968 | 1,435 | 1,704 | 616 | 546 | 516 | 1,046 | 80,145 | 46,810 | 43,7 |
| May 27 | 48.0 | 28.5 | 23.0 | 95.0 | 2,205 | 1,973 | 1,425 | 1,705 | 628 | 562 | 521 | 1,061 | 67,740 | 45,120 | 45,1 |
| June 3 | 52.0 | 25.5 | 21.0 | 95.0 | 2,114 | 1,879 | 1,381 | 1,615 | 568 | 503 | 447 | 972 | 32,445 | 26,980 | 44,8 |
| June 10 | 53.5 | 25.5 | 17.0 | 96.5 | 2,257 | 1,992 | 1,435 | 1,690 | 635 | 554 | 502 | 1,055 | 65,265 | 40,175 | 43,7 |


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS
U.S. & CANADA
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
THOUSANDS OF GROSS TONS
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
THOUSANDS OF TONS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
EXPORTS
IMPORTS
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
PER CENT OF OUTPUT TO TOTAL CAPACITY
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
FAILURES
LIABILITIES
COPYRIGHT 1939 STEEL
NUMBER OF FAILURES IN THOUSANDS
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

# "WHAT PRICE POUNDS"

This question recently was raised by an executive of a large company engaged in mass production of metal products: "Why—throughout a period when price per pound for automobiles and electrical equipment has dropped steadily—should the price per pound for machine tools have trended upward?"

To get to the bottom of this situation it is desirable to take a look at the records, but first let me tell a story. Once upon a time (let us say in June of 1849) a locomotive manufacturer had occasion to buy a machine tool. Upon being quoted $1120 for the 2240-pound machine, he did some quick mental figuring, then came back at the machine tool salesman with something like this: "Outrageous! Since when have you been charging 50 cents a pound for machine tools made out of pig iron that costs your company only $23 a gross ton?"

Conditions existing in the early days of the machine tool industry were such that this "price per pound" idea took root in the minds of machine tool users without resistance on the part of the few and scattered machine tool builders. Many of these early builders had very small organizations and were in the foundry business. Their men worked long hours for as little as $1.00 per day and it is no exaggeration to add that the working proprietor of the business not infrequently contributed his own expert services for as little as $3.00 per day.

### Overhead Was Overlooked

There was little or no understanding of overhead. Even direct waterpower, then very commonly used, was considered a providential gift. Ingenuity and engineering ability were given away—a peculiar form of benevolence which was to persist in the machine tool industry for many years to come.

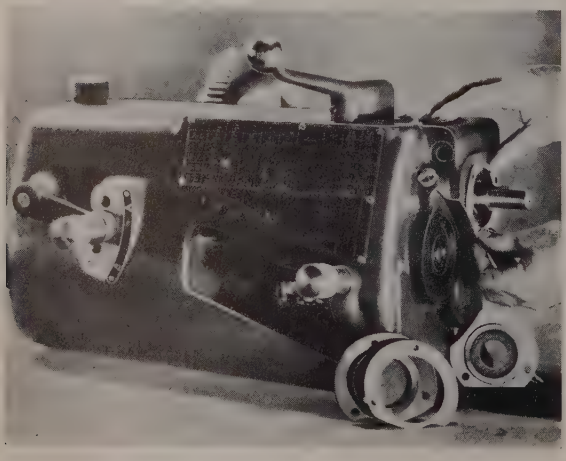
But what of the machine tool men themselves? They were men of simple tastes. They took real pride in their work. Therefore they were content with the very modest living which they earned. Even today the average net profit of the machine tool industry as a whole probably does not exceed 4 per cent.

In the meantime, however, many other industries which were dependent either wholly or in part upon machine tools, grew large and prosperous. At the same time they demanded more and more from machine tool builders in the way of accuracy, operating convenience and production speed. Little by little machine tool builders awoke to the fact that manufacturers of tives, agricultural machiner ing machines, etc. were gettin per pound for their machi products than the machine dustry was getting for its nec hand finished precision ma

With the metalworking in in America growing by lea bounds because of the inter able system of manufacture machine tools made possib chine tool builders were fo pay their own highly skille men much higher wages t them from being drawn i mass production shops. Dep steam power replaced the u propulsion of individual wheels. Coal cost money. Thu became recognized as a manufacturing cost.

It began to dawn upon tool builders that they the were more than mere conve iron and steel into comm chinery. They realized the adding greatly to the wealth through their peculi ity to design and build a very kind of machinery which would produce a wide var other machinery and meta ucts profitable to machine to and of definite public benefi

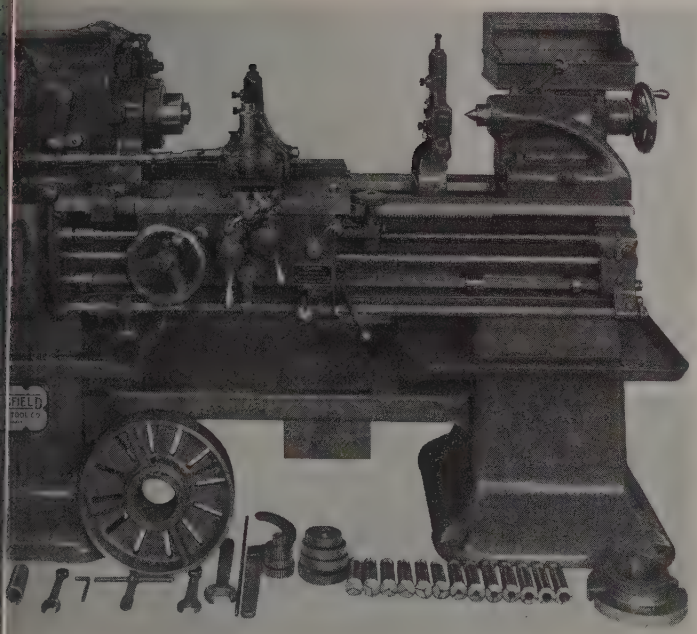
Rather timidly, and never



**Compact quick change feed box—an intricate mechanical unit in itself—has generally been substituted for cheap, but inconvenient and sometimes hazardous arrangements of pick-off gearing**

By GUY HUBBARD
Machine Tool Editor

# rn Machine Tools?



tor driven geared head engine lathe (above) obviously is more ex- build than simple cone head machines of 25 years ago—shown in ft. However, figured on basis of "cost per piece" instead of by archaic pound" formula, the modern machine tool represents an extremely profit- investment where low cost high quality production is involved

ny excessive degree, ma- prices were lifted off the om on which they had long. Eventually there y when purchasing agents, figuring on their detach- when bargaining with ma- l salesmen, began to use pound as the base figure ing quotations. That per- g after automobile buyers n sharply to question auto- lesmen as to how many how few cents per mile t expect from the machine- omobiles offered for their ion. The automobile pros- nterested in the price, but price per pound. What he was the price per mile.

can get back to the orig- tion "Why—throughout a nen price per pound for es and electrical equip- pped steadily—should the pound for machine tools ded upward?" If we must thinking in pounds, here ious answer: "It has cost more to develop and build the constantly improved and increasingly specialized machine tools which have made possible the mass production of better and better automobiles and electrical equipment at lower and lower cost!"

To illustrate this situation it is not necessary to go into details as to increasing demands by machine tool users for machines which in one way or another depart from standard designs. It is not necessary to dwell on the cost of hydraulic and electrical control apparatus. It is not necessary to explain to great length why it costs so much more to build a machine tool capable of working to "tenths" than it did a previous model accurate only to "thousandths." I will not even go into details regarding added expense involved in building machine tools capable of utilizing cemented carbide tools efficiently. I will simply mention a few simple facts regarding the engine lathe.

In the circular illustration is shown the lathe department of a well known machinery plant as it appeared 25 years ago, this in its day being considered a very well equipped department. All this long since has been done away with. The company scrapped all this equipment and re-established the department in a new building equipped with modern motor driven geared head lathes.

The new lathes undoubtedly cost much more per pound than did the old ones, but the company was not concerned with "price per pound"—they had to have lathes which would turn out better work faster than the old ones could. The new machines were sold to them on a "guaranteed performance basis," that they would pay for themselves well within their useful life.

**Improvements Are Expensive**

The illustration on this right hand page, showing a modern motor driven geared head lathe with quick change feed and numerous other refinements, should prove even at a glance why "it costs more per pound" than a lathe of 25 years ago. Compare the cheap but cumbersome arrangement of cone pulleys and countershaft with the much more expensive, compact, quick change geared head—but think of the tremendous improved operating characteristics of the latter. Compare the cheap but primitive pick-off change gear arrangement of the old machines with the quick change feed works and lead screw drive of the new lathe. A modern quick change feed box, such as that shown in the course of assembly on the left hand page, costs almost as much to build today as did a complete small size lathe in the early days of the industry. Even the cast iron which goes to make up a large proportion of the weight of a lathe, no longer is ordinary cast iron as of old. It is a special, hard, high tensile alloy, infinitely better for its purpose.

I might continue in this vein for several pages. That however would be entirely out of line with the following sound advice given recently by Wendell E. Whipp, president of the National Machine Tool Builders' association, to the Associated Machine Tool Dealers: "Let's get away from all this talk about fine castings, ground shafts, etc., except as they may directly contribute profit to the user. We are all 'profit engineers' now. If we follow this plan consistently, the buyer who harks back to the old 'price per pound' formula will become extinct."

# Nut Thread Tolerand

**Need for adjusting standard specifications for commercial nut threads to more nearly represent good practice from manufacturer's as well as user's standpoint is pointed out. Close limits increase cost all out of proportion to slightly improved characteristics obtainable**

By WM. C. STEWART
Technical Adviser
American Institute of Bolt, Nut & Rivet Manufacturers
Cleveland

■ DURING THE past few years, bolt manufacturers and users of nuts have shown an increasing interest in the subject of nut-thread tolerances and gaging. There has been much misunderstanding as to what degree of thread accuracy may be produced economically and what is really required to provide satisfactory service. While little trouble has been experienced with nut threads in actual service, present theoretical specifications for thread tolerances, especially with recent changes in gaging practice, do not represent either what is actually produced or what is needed for satisfactory use.

### Manufacturing Limitations

There are some manufacturing limitations encountered in nut tapping. Nuts are tapped in a variety of machines using taps which for practical reasons are solid so no adjustment of dimensions can be made. Accuracy of nut thread thus is limited by variations encountered in the taps themselves. Only practical way to reduce this variation is to sort taps, which is expensive because of loss in rejected taps and in production time while experimenting.

There are other variations due to the process itself. Commonly used tapping machines employ a more or less flexible tap, the cutting end of which is not rigidly held but floats and centers itself as best it can through a series of nuts which are supported only by being held relatively loosely in a flat-sided passageway. Other variations are encountered due to the commercial variation in width across wrench faces of the nut, lack of parallelism between top and bottom faces of nuts, inaccuracies due to hole in nut being off center, tapered, out of round or not perpendicular to top and bottom faces of the nut. Accuracy of nut threads, therefore, is limited by these factors and by the somewhat random course of the tap in passing through a nuts.

In addition, there is a pr change in nut thread di caused by wear on the tap.

Nut thread form is show 1 which illustrates the tig loosest nut. The toleranc is shown in solid black. be noted that the thread is more at the minor diamete the major diameter.

A thread is specified by number of threads per inc limits on three diamete diameter, major diame minor diameter. Pitch di defined as diameter of an i cylinder, the surface o would pass through the t such points as to make width of the threads and of the spaces cut by the surface. For example, i distance a-b is equal to dis

### No Limits For Thread

No specific limits are angle between sides of th the lead (distance a n along a bolt in one re Variations of these elem controlled by tolerances al pitch diameter. If errors

Abstracted from paper given before American Institute of Bolt, Nut & Rivet Manufacturers at Cleveland, March 23, 1939.

**TABLE I**

merican Standard Pitch Diameter Tolerances and Possible Loss due to Tap and Gage Errors

| American Standard Pitch Diameter Tolerance | | | Pitch Diameter Tolerance lost due to Tap and Gage Errors Maximum | | German Coarse Fit Pitch Diameter Tolerance |
|---|---|---|---|---|---|
| Class 1 | Class 2 | Class 3 | Cut Th'd Tap | Ground Th'd Tap | |
| .0051 | .0036 | .0026 | .0052 | .0024 | .0072 |
| .0063 | .0045 | .0032 | .0060 | .0027 | .0083 |
| .0074 | .0052 | .0037 | .0075 | .0031 | .0092 |
| .0085 | .0059 | .0042 | .0084 | .0040 | .0100 |
| .0092 | .0064 | .0045 | .0098 | .0044 | .0105 |
| .0111 | .0076 | .0054 | .0113 | .0050 | .0117 |
| .0124 | .0085 | .0059 | .0134 | .0057 | .0126 |
| .0145 | .0101 | .0071 | .0151 | .0066 | .0136 |
| .0184 | .0127 | .0089 | .0187 | .0077 | .0157 |

ngle, pitch diameter of be larger than minimum n order to pass a "go" errors are excessive, the eter required in the nut entrance of a "go" gage i the maximum permitted cations and the nut will d by the "no-go" gage. ows a "go" gage, of per- angle and lead, fitted to ead which is correct in has a slight lead error. reads are to engage with- rence, the pitch diameter ut must be larger than gage by a small amount. unt is an equivalent re- available pitch diameter to compensate for lead

**rror Reduces Tolerance**

y, Fig. 2B shows the ef- error in angle of thread to further reduce the tol- vailable for actual pitch variations.

the gage is in error, the pitch diameter tolerance greater in proportion. The ailable pitch diameter tol- tually depends upon the in angle and lead between nut. However, lead and the nut thread cannot be rate than that of the tap. s loss of pitch diameter is dependent to a large on errors in commercial gages.

shows amount of pitch olerance lost due to pitch lead and angle errors of d taps and gages com- h the tolerances allowed American standards and nan coarse fit standards. itch diameter tolerance is, , the sum of various er- se would not necessarily maximum values simul- but since it is possible ndition to exist, this max- st be provided in specifi-

**t thread form and tolerances**

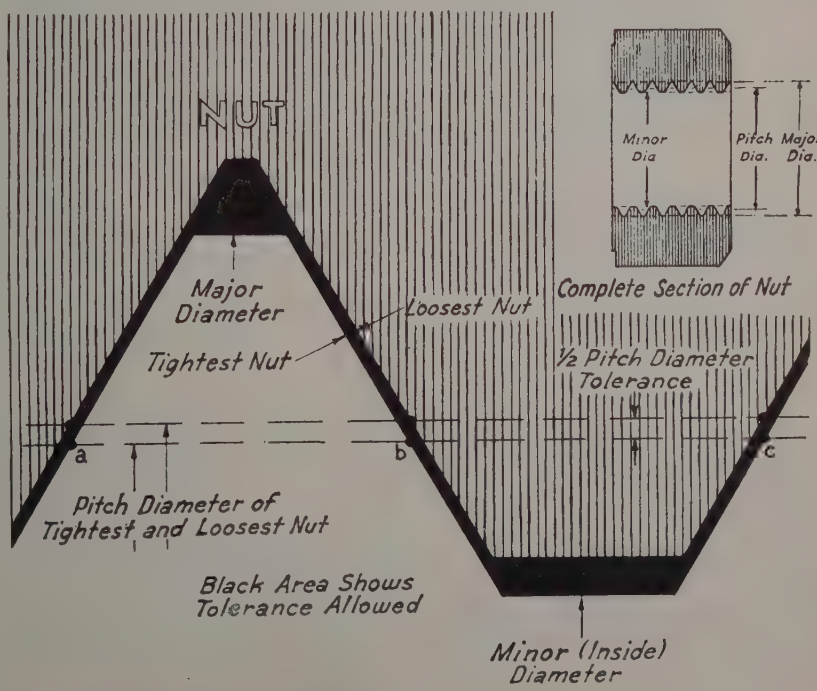
cations if nuts are to pass inspection.

It will be noticed from Table I that loss of pitch diameter tolerance, with commonly used cut-thread taps, is slightly greater than the available Class 1 tolerance. This leaves less than nothing for ordinary manufacturing variations and for tap wear. This discrepancy is intensified by the fact that nuts made close to the tightest permissible limit are unsatisfactory in service because they interfere with ready assembly in high-speed mass-production operations. For this reason, manufacturers have learned to avoid the tighter limit. It is evident that it is difficult to meet Class 1 tolerances consistently.

With the use of a more accurate ground thread tap, the loss of pitch diameter tolerance is approximately equal to the available Class 3 tolerance, leaving nothing to account for manufacturing variations and tap wear. The more liberal Class 2 tolerances might be met with ground thread taps, but it would be expensive and would require tapping machines and blank nuts in the best possible condition, slower tapping speed, shorter tap life and probably sorting of taps. It is evident from the above that it is impractical to meet Class 3 tolerances. Even with ground thread taps and a closely controlled tapping process, it would be necessary to gage every nut and discard those not meeting specifications.

Purpose of gaging is to insure that a nut thread will assemble properly with standard bolt thread. A "go" gage is used to prove that the nut is not too small to assemble. This gage is a plug having threads accurately made to minimum dimensions of the nut thread. It must enter the nut all the way if nut is to be satisfactory. Successful interchangeable manufacture has been carried on for years with the use of "go" gages only. The looseness being controlled by the tap itself. With a properly made tap, the nut cannot be materially larger than tap. As the tap wears, succeeding nuts become smaller until too small to pass the "go" gage, at which point the tap is discarded. Such gaging is satisfactory for the great bulk of nut production, especially since more service difficulties are the result of nuts being too tight rather than too loose.

When various classes of tolerances were specified, it became necessary to use a "no-go" plug gage to



prove that the nut thread was not larger than some arbitrary maximum limit. A "no-go" plug gage is made to maximum limits of the nut and should not enter the nut more than an arbitrary limit of 1½-turns on inspection. "No-go" limits of nut threads are neither as important from a service standpoint nor as susceptible to accurate measurement by plug gages as are "go" limits. When an accurate "go" gage enters the nut all the way, no element of the nut thread is too small since this checks all elements of the thread. A "no-go" gage checks one element only, the point at which interference between the nut and gage thread occurs.

### Full-Form No-Go Gage

The full-form "no-go" gage in common use has thread dimensions following the profile of the standard screw thread except that crest of thread is cut off so outside diameter of gage thread is not greater than that of the "go" gage. Crest of the thread was cut off to insure that the required interference between "no-go" gage and nut will occur on flank of nut thread and not at the crest which may be rounded slightly due to tap wear. Such a gage has been used for those special applications where maximum size of nut thread must be controlled closely. Design of these gages is described in the 1928 report of National Screw Thread Commission.

Recently the truncated "no-go" gage has come into use. This gage, described in the 1933 report of National Screw Thread Commission, differs from the full-form gage in that crest of the thread is cut off or truncated considerably more

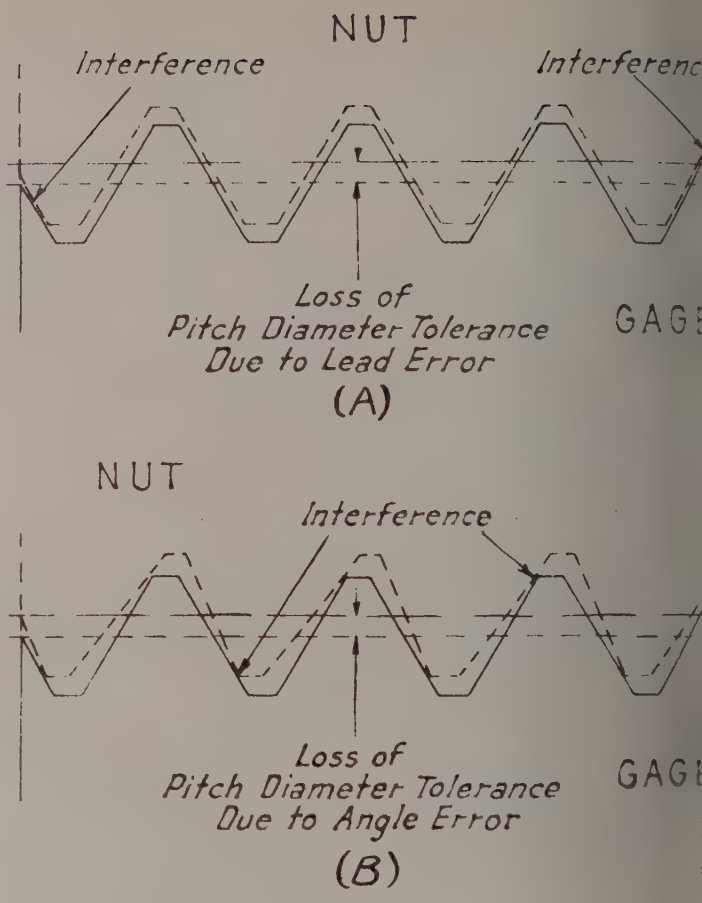
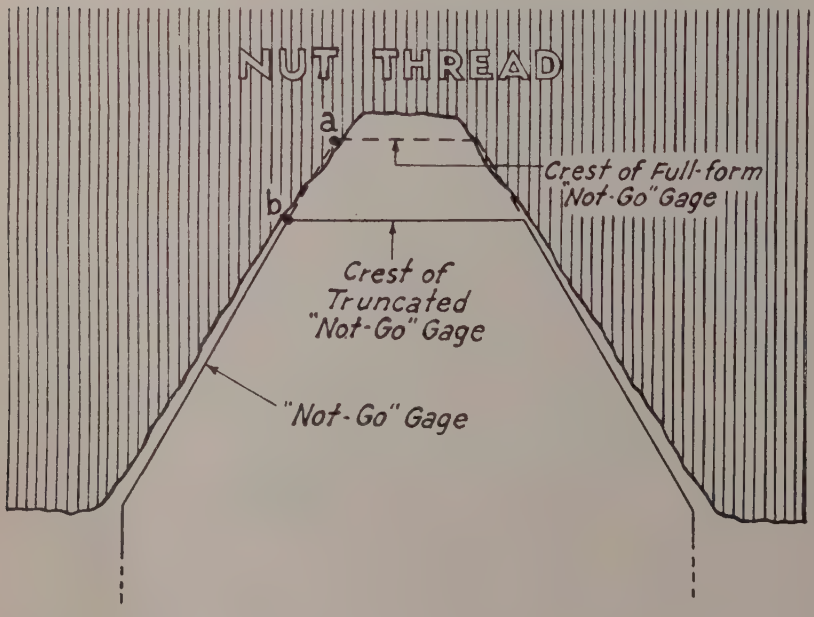



Fig. 2—Effect of lead and angle errors

than was that of the full-form gage. This is to insure that the required interference with the nut thread occurs not only on the flank rather than at the crest of the thread, but at a point closer to the pitch line




so the gage will measure m
ly the pitch diameter. T
cated gage rejects many nu
will pass the full-form
which are satisfactory fro
ice standpoint.

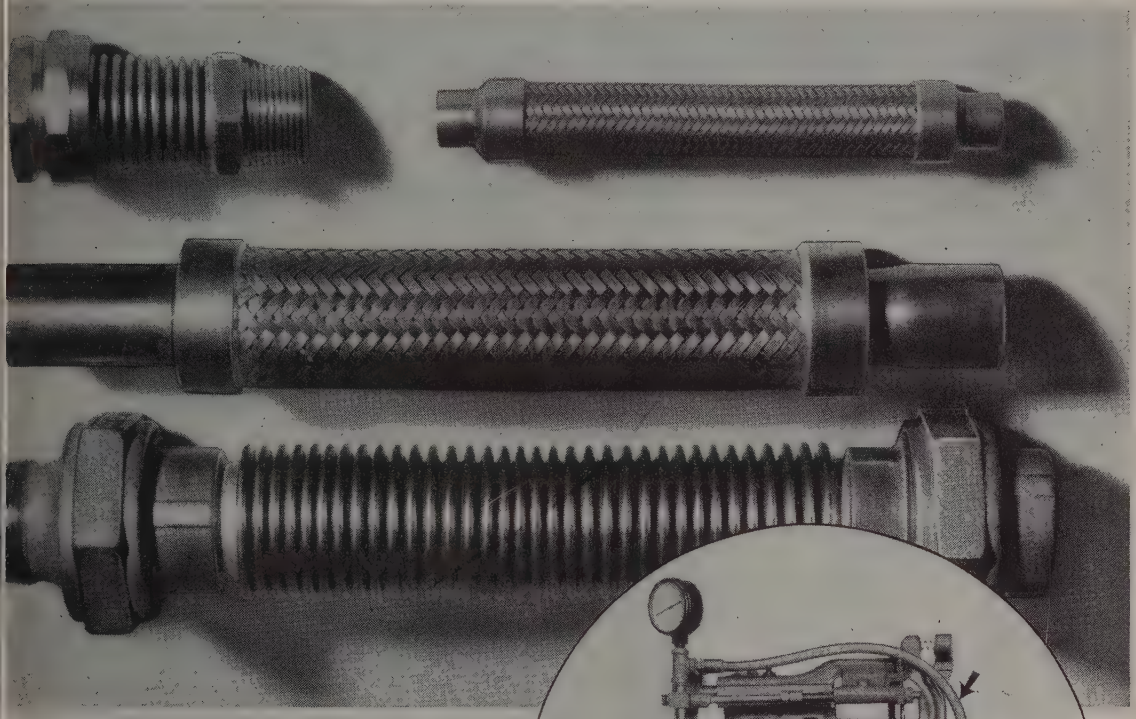
Truncation of crest
thread would have no eff
jections of nuts if both
nut threads were perfect
form. Such perfection, ho
impossible to maintain
gage or nut threads. Th
element principally respon
rejects by the truncated g
angle. The half-angle of
thread may be in error
grees and that of the tap n
error by 45 degrees. Thus,
sible to have a difference
half-angle between nut and
1 degree, due solely to
gage and tap. This differe
creased as nut thread an
to be larger than that of
due to wobbling of tap and
ing tapping. Thus, ave
thread angle is apt to b
larger than 60 degrees. I
in angle between gage a
normal practice may be as
2 degrees.

Effect of truncation of

Fig. 3—Effect of truncated

# amless *Flexible* Connectors

## ..THE SAFETY LINK BETWEEN TWO MOVING PARTS



es of American Seamless Flexible Metal Tubing with various types tings used as leak-proof flexible connectors for taking up vibration, misalignment, etc.

installation of American Seamless Flexible Metal bing is cheap insurance against the need for future ng. Wherever you need a flexible connector or con- . . . for misaligned or moving parts, for absorbing on . . . the one best answer lies in the use of Amer- amless Flexible Metal Tubing.

e are no joints, welds, laps, seams or packing where n occur. For the conveyance of air, water, oil, steam , this flexible tubing has no superior. That's why nd more designers of machinery and maintenance ers are specifying "American Seamless."

*e us about your connector problems.* Our engineering ment has a wealth of information on the use of ican Seamless" on all types of ery. Consultation of this depart- ntails no obligation.

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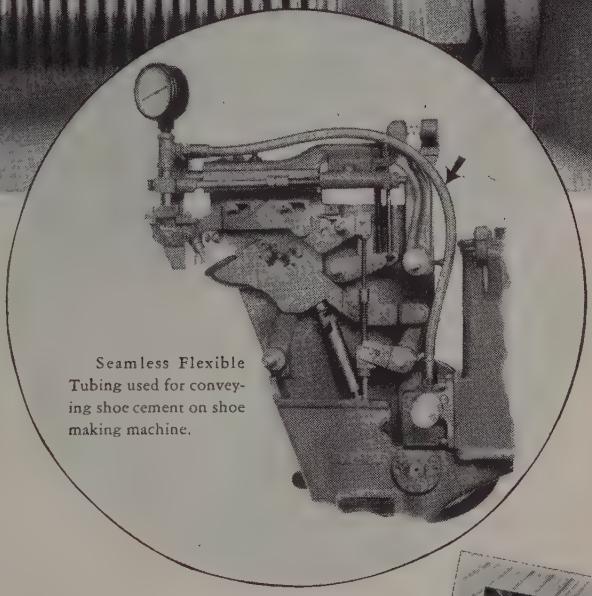
from mine to consumer

89245



Seamless Flexible Tubing used for conveying shoe cement on shoe making machine.

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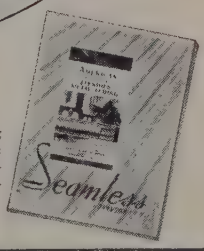


# American Metal Hose

AMERICAN METAL HOSE BRANCH of THE AMERICAN BRASS COMPANY

*General Offices: Waterbury, Conn. • Subsidiary of Anaconda Copper Mining Company*

*In Canada: Anaconda American Brass Ltd., New Toronto, Ont.*

produced by difference in angle between gage and nut thread is illustrated in Fig. 3, which shows a nut thread in irregular outline and with a thread angle differing slightly from that of the "no-go" gage. Both full-form and truncated "not-go" gages are illustrated. Note that nut thread interferes with full-form "no-go" gage at point "a," so that nut is acceptable to a full-form gage. No interference takes place with the truncated gage as there is a clearance at point b, so nut would be rejected. In any lot of nuts accepted by a full-form gage, a large percentage will be rejected by a truncated gage. Thus, use of a truncated gage substantially reduces permissible manufacturing tolerances. It also materially increases rejections of nuts heretofore acceptable.

### Thread Strength

Will strength of the joint between nut and bolt against stripping be improved by maintaining closer tolerances on the nut even though this means a material increase in cost? This is a hypothetical question since nut proportions have been so established that resistance to stripping of threads is much greater than breaking strength of the bolt, even with a looser thread fit than is commercially produced. Thus strength of the threaded joint is not ordinarily the limiting factor determining strength of a bolted connection.

Fig. 4 represents the loosest fit between a Class 2 bolt and Classes 1 and 2 nut. Black area shows metal added to a Class 1 nut to produce Class 2. The working load is transferred across the section c-b.

Failure of threads between bolt and nut occurs by shearing of bolt thread at a-b, the minimum shearing area. Shearing would not normally occur in the nut at section c-d, as this section is larger because it is at a greater diameter and also is larger because of the greater depth of thread on the bolt. These two effects give approximately 30 per cent increase in shearing area for section c-b. Inside diameter of nut, which determines minimum shearing section a-b, is the same for all classes of tolerances. Thus, strength of joint is not increased for ordinary materials by maintaining Class 2 tolerances on the nut. Nothing useful has been gained by adding the small amount of metal shown by the heavy black area to produce Class 2 tolerances. Metal added does not contribute to joint strength. The same conclusions are reached if Class 3 tolerances were maintained, as here just a little more metal is added to the non-working surfaces of the nut.

Where high strength is required, a hard, heat treated alloy-steel bolt may be used with a softer nut. Then, due to lesser strength of nut material, failure may occur in the nut at C-D. With such a condition, closer tolerances on the nut would add a small amount to the shear-ign area in proportion to the thickness of the black area and so improve strength slightly. Based on a Class 1 nut, this increase would amount to 2.3 per cent for Class 2 tolerances, and 3.9 per cent for Class 3 tolerances. Thus, increase in shearing area is insignificant compared to large increase in cost of maintaining such tolerances.

Increased stripping strength of nut when required should be obtained by employing a stronger metal, heat treatment, or thicker nut.

In conclusion it will be realized that pitch diameter tolerance of nut as usually specified does not represent a variation of which the manufacturer can take full advantage. Available tolerance is reduced greatly by a series of unavoidable losses resulting from errors in taps and gages, truncation of the "no-go" gage, and by the practical necessity of not working too close to the tighter limits of the specifications. Thus, in establishing commercial tolerances for nuts, tolerances must be broad enough to encompass these losses and in addition must provide a reasonable allowance for tap wear and normal variations occurring even in good tapping practice. Nuts produced under such tolerances over a period of years have been satisfactory in service. Closer tolerances appear impractical, especially as they do not offer a commensurate increase in quality.

As a solution to this problem it has been suggested that Am standard Class 1 tolerances cepted as standard for nuts. 1 gages are available comme and their use undoubtedly eliminate much of the presen nical difficulty between manu ers and users of nuts. It is n ficiently established as yet ever, that Class 1 tolerances met consistently by ordinar ping processes. Possibly ne broader tolerance specificatio use with nuts only will be necessary. German tolerances in Table 1 as well as other pean systems of tolerance variations more consistent good manufacturing practice present American standards.

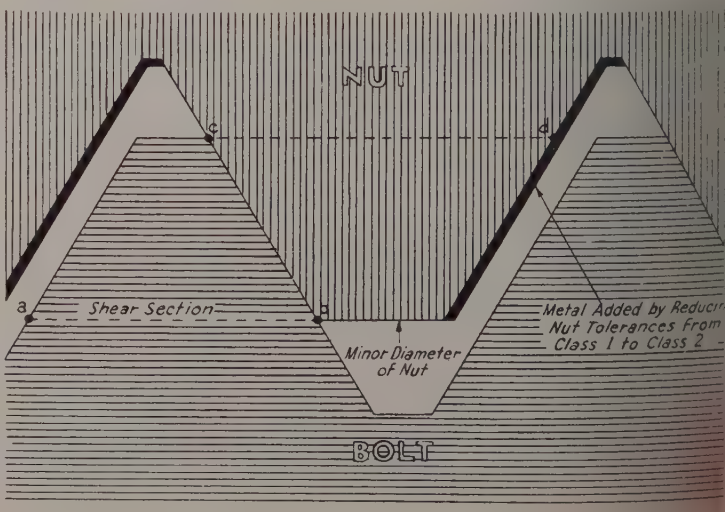


**Fig. 4—Effect of nut thread tolerances on strength**

♦

## Advice on Exhaust Systems, for Enginee

■ *Design of Industrial E Systems,* by John L. Alder pages; published by Ind Press, New York; supplied by Cleveland, for $3; in Euro Penton Publishing Co. Ltd., House, Westminster, London

Purpose of this book, as sta the author, is to tell the en how to design and build or b buy an exhaust system tha perform adequately and ec ically the functions prescrib the industrial hygiene expert the law. The work combin theory of air flow to specific cations of exhaust systems dustry.

The text covers the followir jects: Flow of fluids, hood air flow through hoods, pipe ance, piping design, dust sepa low pressure conveyors, centi exhaust fans, structural detai system planning, field me ments and their interpretati

Forty-ton crane, equipped with G-E control, in a cold-strip mill in the South

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## AY TONNAGE-MINDED STEEL MEN

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al foreman in another plant points particularly ling of tin plate in the cold reduction depart- E equipped crane is used to lower stacks of tin sition for annealing. Its smooth, precise opera- he sheets in exact position so that the furnace closed over a stack without difficulty or delay, valuable time.

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GENERAL ELECTRIC

# Classifying

**Power truck greatly facilitates warehouse operations, triples storage capacity in same floor space, cuts handling costs 50 per cent. Since handling is largest cost item here, these savings easily mean difference between a loss and a good profit**

By DONALD C. LOTT
President
Tin Mill Products Corp.
Pittsburgh

RECENTLY use of a gasoline powered fork type lift truck at Tin Mill Products Corp., Pittsburgh, has been found a most efficient means of transferring steel sheet throughout unloading, classifying, storing and shipping operations.

Two general types of material are handled in this warehouse—tin mill black plate and tin plate. All material is between 20 and 34 gage, corresponding in thickness from 0.0375 to 0.0085 inch. This tin mill black plate is handled in wide variety of sizes and finishes including steamed blue, enameling stock, pickled dry, cold reduced, cold reduced and deoxidized, pickled annealed one-pass cold rolled, and others. This means that a large number of individual items or lots are made up, kept in storage and shipped. For instance, a recent listing of tin mill black plate stock included nearly 400 lots.

Result of this large number of items and numerous steps in handling is that handling operations themselves form possibly the most important element in determining whether a profit or loss is made on the warehouse operations. In addition to those items already mentioned, a large volume of tin plate also is handled and sorted in a similar manner.

Tin Mill Products Corp. does no processing of the steel sheets. Overruns of tin plate and tin mill black plate are received direct from the rolling mill on box cars on a railroad siding along the north end of the warehouse building. Here a car is spotted opposite the warehouse door and a floor plate laid connecting the warehouse floor with the car floor.

This then permits a Towmotor fork-type truck to enter the car and remove the packaged shee terial is packed in the box the rolling mill in bundles i ally wrapped in water-proo and steel strapped to woode About 35 to 40 tons of sh shipped per car. Of cou individual bundles are bra curely in the car to preven ment during shipping.

Truck easily enters car moves bundles as shown 2 since overall width of t widest point is 41½ inch overall length is 90 inches ing 20-inch forks. The 95-in ing radius permits sharp t be made in small space.

**Packs Slid Endwise on F**

When large sheet packs, 7 long, arrive at the warehou are removed from the box sliding them endwise on from the car instead of us truck. As car door is only 7 wide, it would be extreme cult to remove them thro door lengthwise.

After being removed fr cars, the material is depo the sorting area shown in where the steel bands are and each bundle is inspect fully. At the right in Fig shown the classifying table each individual sheet is ga curately for thickness, t termining in which pile the to be placed during the a operation.

After being classified as t ness, sheets are placed in with others of same leng

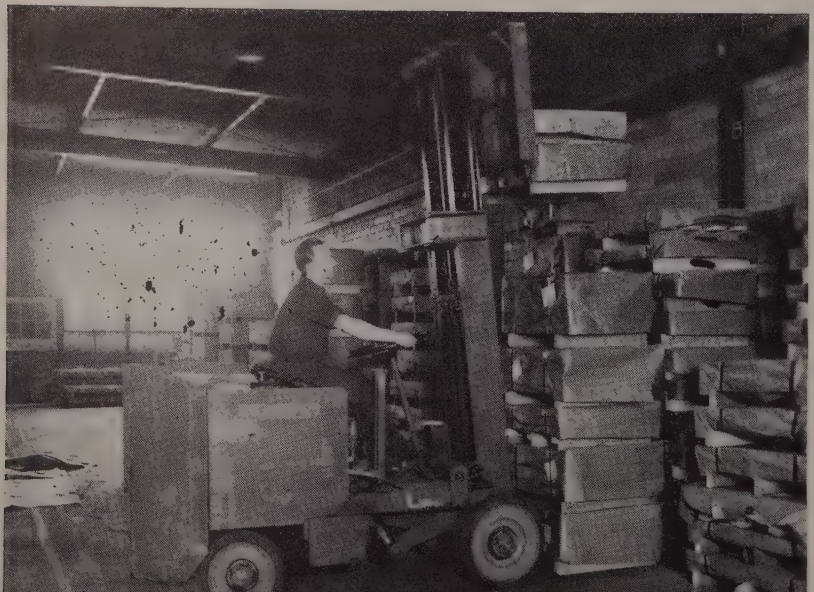

**Fig. 1—Towmotor truck easil bundles six or more high, gr creasing storage capacity pe foot of floor area**

# *Without Steel We'd Have To*

# E AMERICA BACK TO THE INDIANS

top to realize how utterly your comfort, , life itself depend upon steel? When leep, walk, ride, telephone or telegraph sing steel.

steel there would be no newspaper, ; no heated homes, no modern office ry buildings; no electric light, no gas, And as for national defense -- steel is y bulwark of the nation.

ything you use and enjoy depends tly or indirectly on steel. Because of improvements made in steel in recent years thousands of products are of better grade, and cost less -- and hundreds of new products are possible. The steel industry knows how important it is to employment and prosperity to maintain constant improvement in steel and manufacture. That is why Youngstown spends millions to improve its facilities and products and to help the public employ steel to better advantage.

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width. After being sorted in this manner, sheets are rebanded, wrapped in waterproof paper and steel strapped to wooden skids. The truck then places them in storage as shown in Fig. 1.

Tin plate is received from the rolling mills as "tin plate waste waste." This material comes in different sizes and thicknesses which are assorted by inspecting each sheet for thickness and placing it with other sheets of same size and thickness. These classifying operations involve building up a stock of the various sizes, so the large rack shown in background of Fig. 3 is used to accumulate quantities of various sizes. For instance, tin plate is classified into 18 different weights according to thickness, varying from 90-pound to 235-pound material, the thicknesses corresponding to 0.010 and 0.027-inch respectively. In addition to these various thickness classifications, sheet also is classified according to length and width.

Tin plate comes to the warehouse in boxes weighing about 200 pounds each. Ten of these boxes are wire strapped together on a skid so the bundle weighs about 2000 pounds, the average weight of bundles handled here.

Importance of efficient handling of this material is easily seen. Formerly a hydraulic hand truck was used to lift bundles during unloading, stocking, classifying and loading operations, but capacity was limited to about 2500 pounds, which meant that two small or medium size bundles were all that could be handled at one time.

Now the power truck easily un-

Fig. 2—Truck loads and un
rial in box cars easily bec
extreme maneuverab

loads 35 to 40 tons of ma
a freight car in a little
an hour. In addition
stacking the bundles to a
height of 10 feet, yet th
can easily enter a freig
cause of its telescopic lif
tion. Governed maximur
set at 6 miles per hou
capacity of the Towmot
pounds at 18 inches fro
lifting carriage. The
gasoline engine develops
power and consumes le
gallon of gasoline per
used at this plant. Of c
not operated continuall
long.

Since the power truck
to a height of 10 feet,
bundles can be stacked s
high as shown in Fig.
capacity of the wareh
least triple that whe
could only be stacked
Also it stacks much f
previous method, thus s
in unloading cars and
outgoing shipments, as
speeding up movement
throughout the classify
tions.

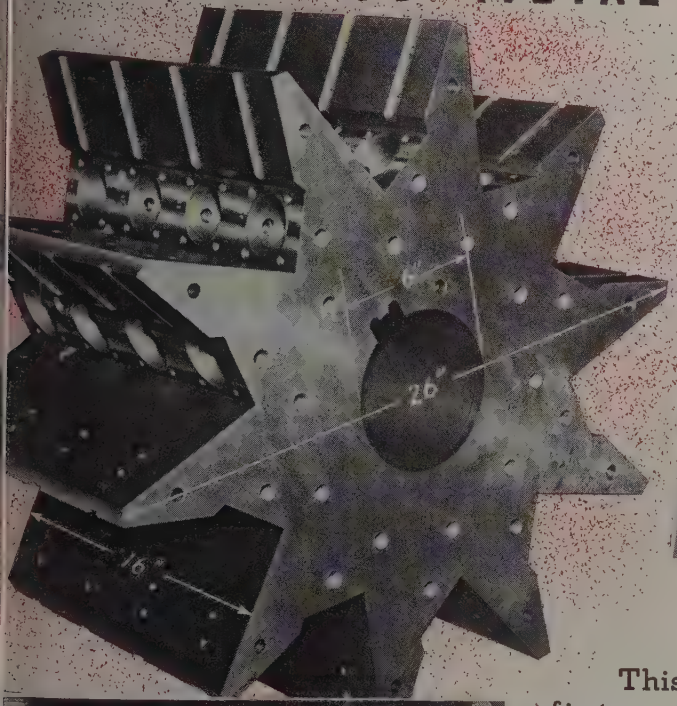
The warehouse is 50
and 118 feet long and ha
capacity to store 1500 t
terial. Material is shipp

(*Please turn to Pag*

Fig. 3. (Top)—classifying
station at right with classify
background. Fig. 4. (Cente
tor runs right onto highwa
or deposits sheet packs on
and pushes them to front
shown in Fig. 5 at b

# MEEHANITE

## OR *FLAWLESS* METAL STRUCTURE



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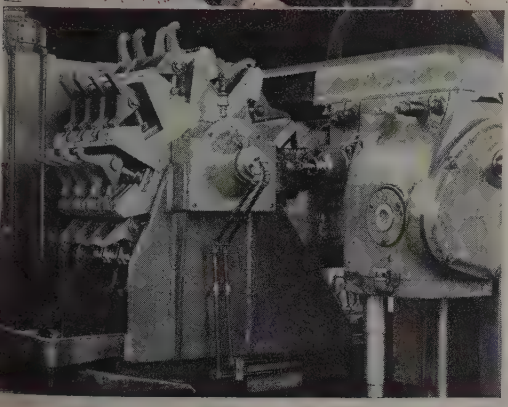

This intricate rotary drum type fixture for a Cincinnati Milling Machine Company's Special Profile Miller was cast in *Meehanite Metal* to insure a uniformly solid casting, free from shrinks and blow-holes and readily machinable. The unmachined casting weighed 1645 pounds, contained heavy sections up to 17 inches,—proved to be entirely flawless when subjected to the many machining operations necessary.

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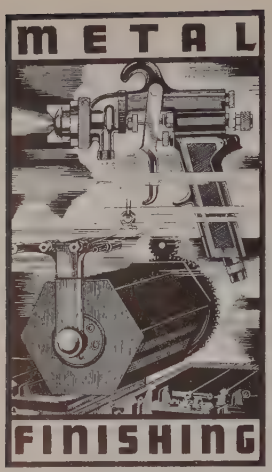


# Plating Aluminum

## New process applies a tenacious coating o aluminum alloys, die castings and wrough or extruded metal to increase wear resis ance, decorative effect, ease of solderin

By RAYMOND F. YATES
Krome-Alume Inc.
Lockport, N. Y.

■ IT HAS long been realized that a successful method of plating aluminum would greatly increase its use and bring about many applications heretofore denied. Plating for eye appeal alone is important in certain industries. In others, resistance to wear is the essential factor.

Also when aluminum is flashed or "struck" in a nickel bath for ten to fifteen minutes, it may be soldered with any of the commercially available solders and fluxes intended for other metals. Thus the advantages to be gained by plating are threefold.

Although there have been many previous attempts to plate this stubborn metal and a number of patents have been issued covering proposed processes, it was only recently that the Krome-Alume method was successfully introduced. Many installations are now being designed and it is estimated that before another year has passed 25 per cent of the aluminum used in certain industries will be plated either for increased wear, added decoration or ease of soldering.

### Oxide Causes Peeling

Failure to plate aluminum previously is traceable not only to its highly electro-positive nature but also to the fact that aluminum oxidizes so freely and quickly that the surface of the virgin metal cannot be preserved long enough for immersion in a nickel bath. If plated with the oxide intact, the plating will peel even though the oxide skin may be little more than a millionth of an inch in thickness.

Naturally, all previous efforts to plate aluminum were directed toward removal of this film or skin. Thus it is somewhat of a paradox that the present process, instead of aiming at the removal of the film, builds it up to a thickne haps 0.0005 inch, althou over such a deposit of alu ide would be entirely abo

This oxide surface is in a bath of oxalic acid by alternating current. The c process lies in the subse tial removal of this anodi film with a simple che tends to dissolve it away. required for this phase of ment depends entirely up loy to be plated and varie seconds to 14 minutes.

After this treatment, th rinsed and is then ready in standard nickel baths, or cold, bright or gray.

### Nickel Plating Recom

While metals other th may be plated next to the the inventor of the prese recommends nickel as the able for reasons that wil fied by reference to the ele ical series and the various involved. Then, over a th of nickel, it is possible to of the other metals in co

Experience shows that may be prepared for pla cost of about $0.0025 per s and that it cannot only be more successfully than e or steel but at a cost that if not slightly lower. Inst the necessary equipment $500.00 for a 15-kilowatt p

The anodizing is done nating current and the pr ing process requires only icals and from 11 to 20 m preparation. With this p aluminum alloy lies be reach of good plating. Th shown is at times utterly

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**Setup at Eastman Kodak Co ter, N. Y., where aluminu camera cases are electropl the method described**

*Community Plate*

Chest of Community Plate,
in Coronation design

# ase of plating perfection...
# r cleaning with ORTHOSIL

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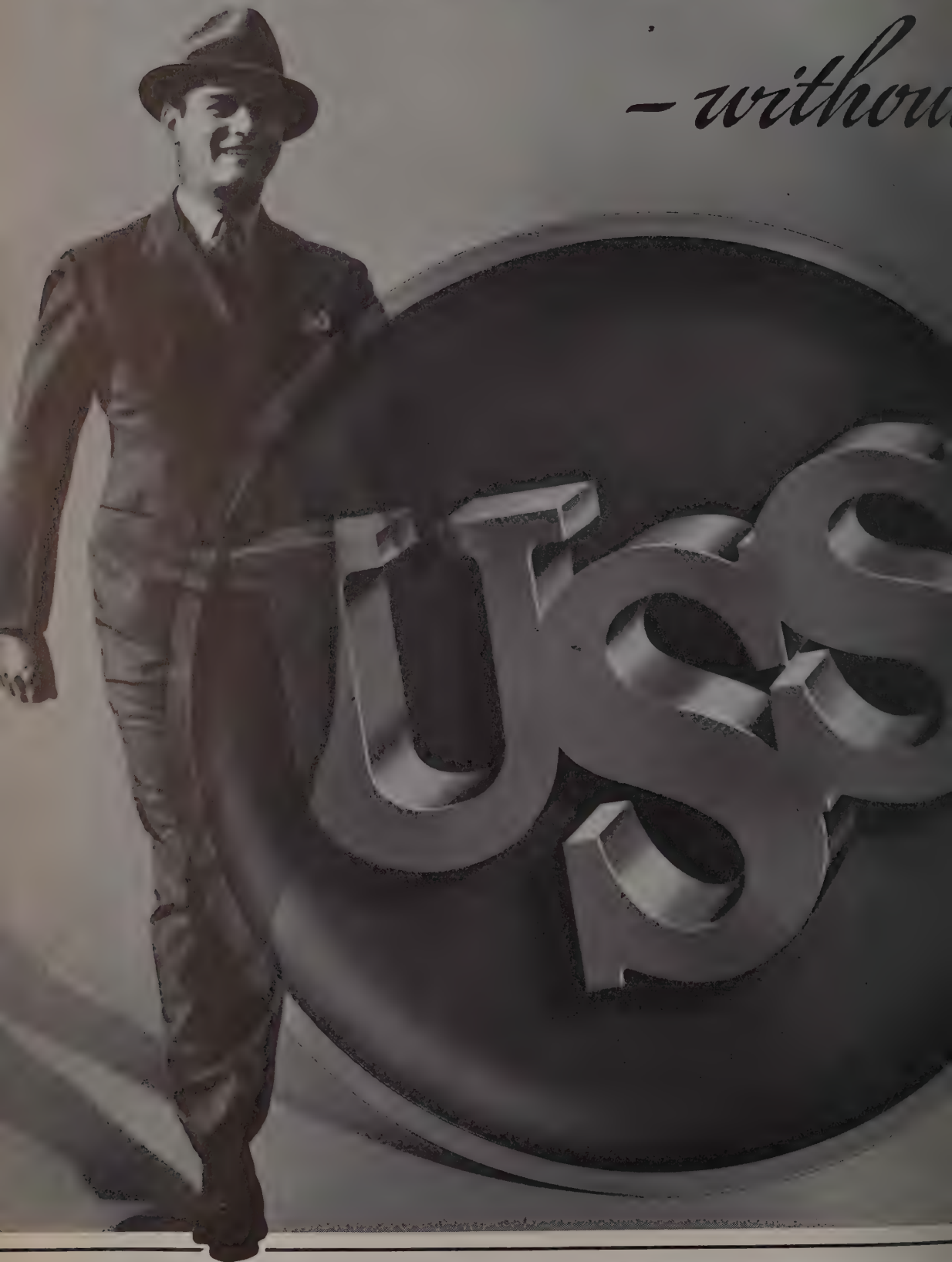


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# Carbon Aids Welding

**Use of carbon rods, plates and paste prove valuable in controlling flow of molten meta Also saves weld metal and welding curren reducing work required in finishing**

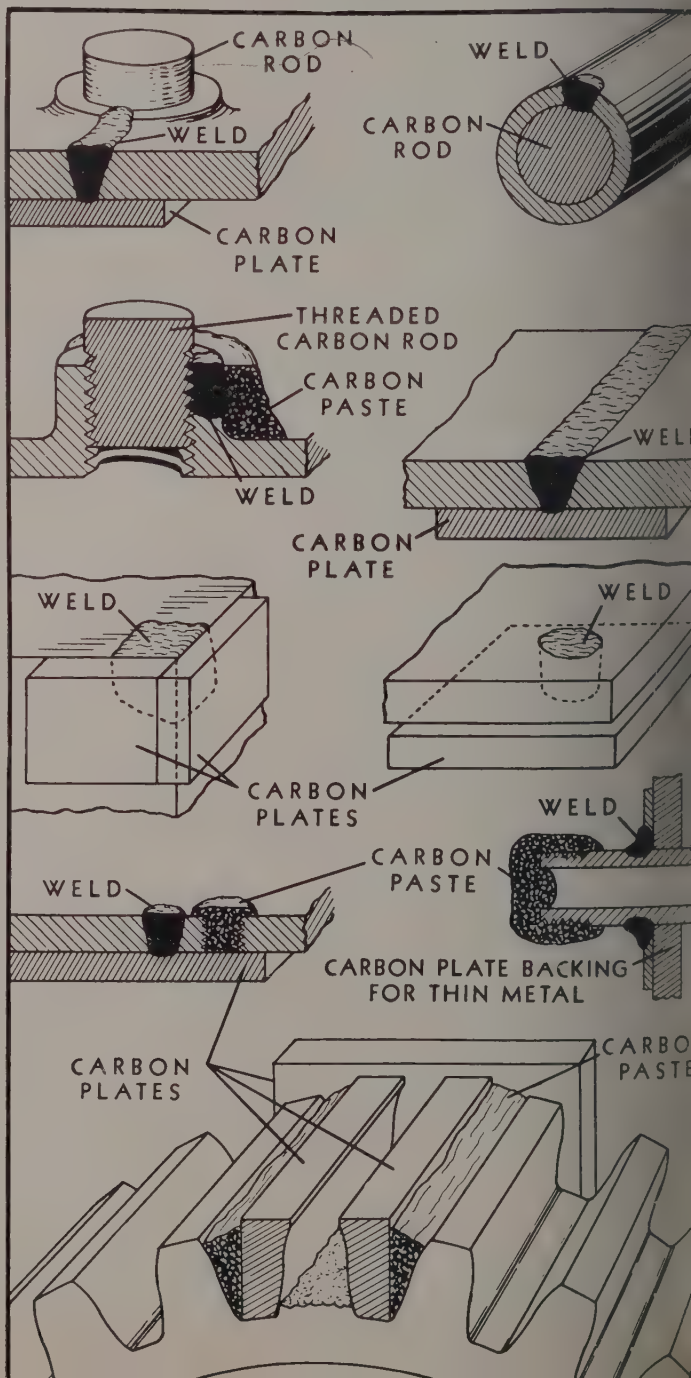
■ WIDESPREAD use of fusion and bronze welding to repair and build up worn surfaces has emphasized the need for controlling the flow of molten metal during such operations. It is desirable to restrict the flow of metal for two reasons: First, by restricting application of metal, grinding and finishing operations are reduced, thus cutting cost of handling the job. Second, the cost is reduced still further by making it necessary to melt only that amount of metal required to give the desired outline or shape of part being repaired. This means lower material cuts, less welding current consumed and a saving in operator's time as well.

To permit these savings to be realized, carbon rods, plates and paste are available. These materials can be used for molds, cores and dams to restrict the flow of molten metal and also to protect adjacent parts against excessive heating.

### Carbon Used Again

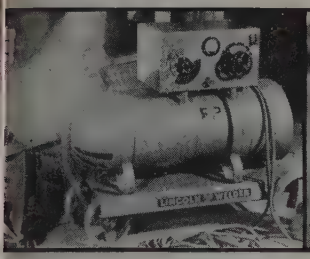
Quite frequently it will be found advantageous to protect adjacent areas with carbon plates or paste against the welding heat. For this use, carbon materials appear better than metal shields since weld solder or metal will not adhere tightly to the carbon material. Also, it is removed easily. After this the fact that the carbon material is not damaged by use makes it very economical as well. The carbon material can be used over again with good results.

Accompanying diagrams show a few ways in which carbon rods, plates and paste can be used to advantage in welding operations. One




**Suggested applications of carbon rods, plates and paste in various types of welding and repair work. Drawing courtesy National Carbon Co. Inc., Cleveland**

# WHAT DO YOU KNOW
## *bout arc welding machines?*



an large electrodes be used for
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er: By using a *"Shield-Arc."*
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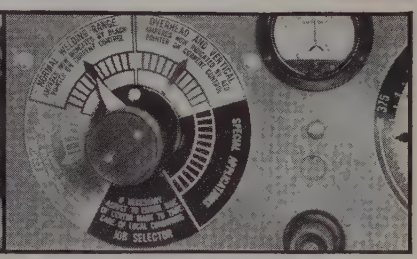
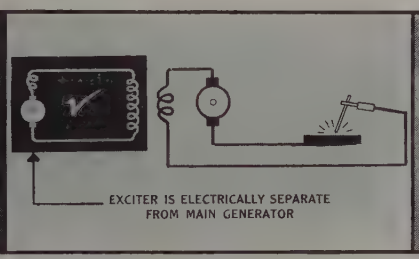
rom burnout, making possible
peration at high average loads.

**2.** What is the full meaning of *"Shield-Arc's"* Self-Protection? It prevents burnout *from any cause*...sustained overload, single-phase running, high or low line-voltage, phase unbalance or impaired ventilation...avoiding delays and expense.

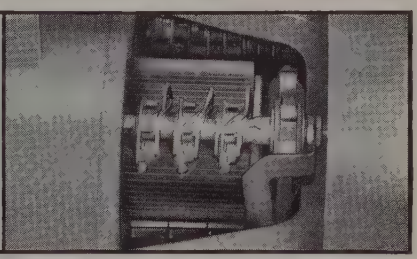



**3.** How can the TYPE of welding arc be varied to suit various joints and working conditions for maximum speed and quality on *every* job? Answer: With a volt-ampere-slope control. Only *"Shield-Arc"* has this "Job Selector."

welder provides *continuous*
both the TYPE of arc and
ERAGE with all settings
ght on the control dials?
*Shield-Arc."* This simplifies
nd minimizes welding cost.




**5.** How does Lincoln Separate Excitation improve welding? Answer: It acts like an electrical flywheel, providing constant power for a steady arc under all welding conditions, assuring easier welding and quality results.



**6.** How can you assure long life for brushes and commutator? Answer: Buy a *"Shield-Arc"* and eliminate the need for brush-shifting. The brushes are fixed at the factory for *permanent* sparkless operation. They seldom require attention.

advantage has *"Shield-Arc's"*
Magnetic Circuit over solid
ver: It quickens the generator's
changing conditions at the
s faster welding and less spat-
ll conditions.

**8.** What two types of polarity switches are used on welders? Answer: One type is in the welding circuit. The other (*"Shield-Arc's"*) is in the excitation circuit —it carries no heavy current to burn contacts and can be used as a disconnect.

**9.** Why can thin-gauge material be welded so effectively and economically with a *"Shield-Arc"* Welder? Answer: Because its Dual Continuous Control makes available extremely low current values without need for wasteful resistances.

***rther details, consult the nearest Lincoln office or mail the coupon***

***st Manufacturers of Arc Welding Equipment in the World***

**E LINCOLN ELECTRIC COMPANY**

**CLEVELAND, OHIO**

**THE LINCOLN ELECTRIC CO., Dept. Y-613, Cleveland, O.**
Send further explanation of [1] [2] [3] [4] [5] [6] [7] [8] [9]. Send free bulletin on *"Shield-Arc"* Welder.

Name _____ Position _____

Company _____

Address _____

City _____ State _____

company recommends use of their welding carbon rods as cores and fillers to save drilling holes that otherwise might be filled with metal during the welding process. Tapped holes may be given added protection by threading the carbon rod to fit. Such rods are available in sizes up to 3 inches in diameter and in 12 to 14 inch lengths, and no doubt other sizes are obtainable.

Carbon plates are used as backing up material when welding thin plates or sections. When building up missing or broken parts with the electric arc or oxyacetylene torch, carbon plates may be used as a dam to prevent molten metal from flowing beyond the immediate field of operation. Such carbon plates are particularly useful in making forms when building up broken parts, such as broken teeth on gears or pinions. Placed underneath a weld, carbon plates preserve a smooth surface and remove the need for subsequent machining or chipping.

To indicate the wide range of plate sizes available for such work, the accompanying table is given. It will be noted that material is available from ⅛-inch to 2 inches in thickness and from 6 x 12 inches up to 15 x 18 inches in size.

Such plates can be cut easily with a hacksaw to any desired shape. Also they can be shaped into practically any form with a file or an abrasive wheel. While they are mechanically strong and highly refractory, they do not shrink when heated during welding and do not burn, chip or break easily. Under normal conditions they can be used repeatedly.

### Carbon Also in Paste Form

At some time or other, every welder has felt the need for a fire and heat resisting compound which could be molded easily into any desired shape or which could be used to fill various depressions or openings to keep the molten metal out. A suitable carbon paste has been developed to meet these requirements.

When building up the metal around threaded or irregularly shaped holes, or where it is necessary to use the arc or torch between or near machined surfaces, such a carbon paste may be used as a protective covering to save much time and subsequent machining. It also aids in producing a neater appearing job. It is an excellent medium for protecting gear teeth and other finished surfaces adjacent to the welded section.

Thin aluminum sections or light parts can be backed up with carbon paste to prevent collapse of the metal when heated. For lining broken sections, either large or small, the usual shimming process can be dispensed with and much time saved by using carbon paste as a work cushion while the parts are being placed in position. The material also will hold the parts in the correct position during the subsequent welding operation.

While these are some of the more common applications of carbon materials in welding operations, there are undoubtedly many others where such materials can be used to considerable advantage.

## Prevents Weld Corrosion

■ To prevent corrosion at overlap and adhesion of weld spatter on metal to be lap welded, Glyptal 1294 gray, a pigmented version of Glyptal 1294 clear, has been announced by General Electric Co., Schenectady, N. Y. Work brushed or sprayed with it can be left exposed to the atmosphere until fabrication is complete with the assurance that edges will not need cleaning before final welding. Shipbuilders and pipe and tank manufacturers are expected to find it useful.

## Low-Carbon Welding Rod

■ To assure arc stability and easy restriking of arc with small low-voltage transformer welders in general welding and repair work on light gage sheet steel, Lincoln Electric Co., 12818 Coit road, Cleveland, has developed Readyweld, a low-carbon steel rod with a heavy extruded shielded arc coating and weld metal possessing high strength and ductility. Primarily for use with alternating current transformer welders of low open-circuit voltage, it also operates with direct current negative plants. Rods are manufactured in 3/32-inch diameter, 12-inch length and are packed in 25-pound containers.

# Large Ladles Are All-Welde

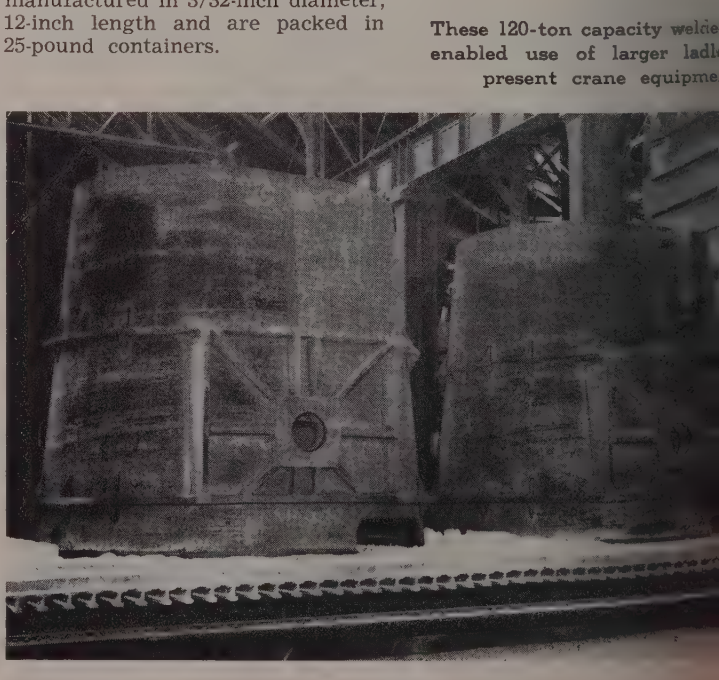
■ SHOWN IN the accompa lustration are two of a s nine 120-ton ladles recen pleted for use in plants lehem Steel Co. The firs welded ladle was placed in few years ago with a total o ladles now in use in vario lehem plants.

Improvements in open practice necessitated increas capacity. The lifting cap hooks and crane equipment ited. If conventional ladle had been used, the weight larger ladles necessary to the larger capacity, includ stopper rigging, would h creased from 54,000 to 65,000 This increase in weight plus ditional 120 tons of hot me handled would have require sive changes in lifting eq and building structure.

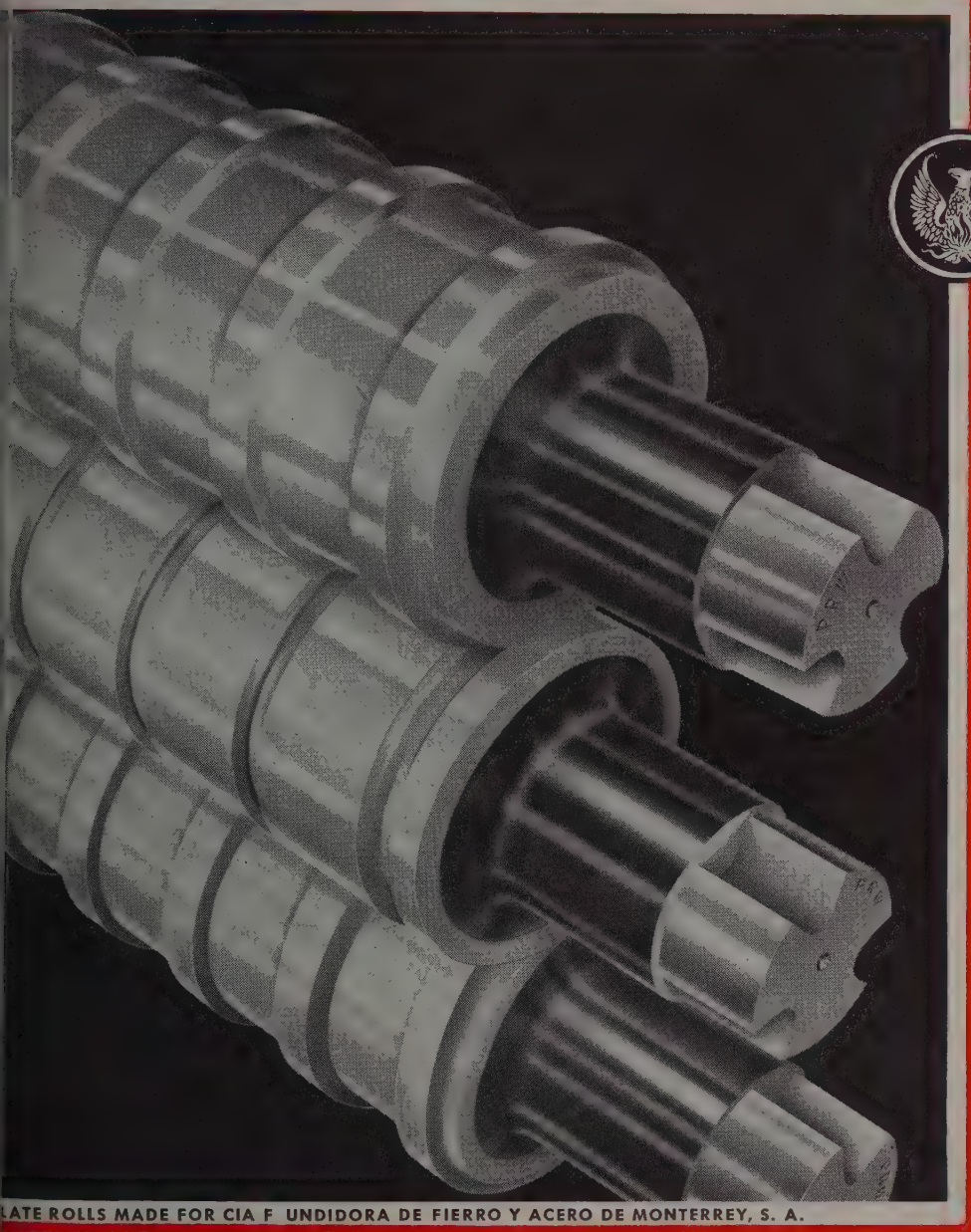
However, by substituti welded steel ladles, each only 38,000 pounds, it wa that no change was neces hooks or cranes and the subs of 120-ton ladles could thus gradually as the smaller la came unfit for service.

The new ladles are welded by qualified welde high quality steel plate and steel trunnions. They are c ly stress relieved after Principal dimensions are axis, top 12½ feet, bottom 5 inches; minor axis, top 1 inches, bottom 8½ feet; outsi nion, 13 feet 9 inches; height

**These 120-ton capacity welde enabled use of larger ladl present crane equipme**



# SS COST PER TON STEEL ROLLED



LATE ROLLS MADE FOR CIA F UNDIDORA DE FIERRO Y ACERO DE MONTERREY, S. A.

Not "Jacks-of-all-trades" but *Masters* of one are the makers of the world-famed Phoenix Rolls. That's why Phoenix Rolls serve better and longer, cut mill costs to the minimum.

**PHOENIX ROLLS CUT COSTS, INCREASE PRODUCTION IN**

STRIP MILLS
BLOOMING MILLS
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RAIL MILLS
SHEET & TIN MILLS
ROD MILLS
STRUCTURAL MILLS
SKELP MILLS
MERCHANT BAR AND BILLET MILLS
PIPE & TUBE MILLS
NON FERROUS MILLS

# IOENIX ROLLS

TTSBURGH ROLLS DIVISION of BLAW-KNOX CO.—*"Steel's Partner"*
Pittsburgh, Pa.

# Enlarges Cold Mill

**New facilities include 4-high roughing mill and 2-high finishing mill, both handling sheet up to 30 inches in width. New continuous pickler unit features individually driven reel drums which greatly increase flexibility of pickling operations**

■ RECENTLY Superior Steel Corp., Pittsburgh, completed installation of new equipment, rearrangement of buildings and facilities to increase maximum capacity of cold mill from width of 20 inches up to a maximum of 30 inches. One of the primary purposes in the modernization program was to provide wider capacity to handle stainless steel strip which each year constitutes an increasingly larger portion of the output of this plant.

New cold mill building is 80 x 260 feet. A 20-ton crane operates across the full width and down the full length of this area. Referring to the layout diagram Fig. 1, the new cold mill building will be seen near the center of this diagram. Material comes from the hot mill at the extreme left. It may be stored either in an outdoor storage area under crane-ways as indicated or may pass into the storage and pickling building which immediately adjoins the cold mill building. After pickling and cleaning, strip may go to the new cold mill.

### Annealing Department Enlarged

The new annealing department immediately east of the new cold mill now contains five circular annealing covers each with three bases for annealing coils under controlled atmosphere conditions. New annealing department was described in detail in STEEL, March 20, page 52. After annealing, material may go to the rolling mill building just north of the annealing department where additional rolling operations are performed. From here the coils pass to the shipping department for shipping. Thus path of material through the plant roughly follows a U with an elongated leg at the left portion. Of course, various types of special material require some departure from this outline, but in general, flow of material through the plant is as outlined.

Movement of material between the various buildings and departments is facilitated by use of a narrow-gage railway system. Some 300 cars are employed to move material on this system and ten engines furnish the motive power. Engines are of the electric type fed from an overhead trolley wire. By applying an efficiently laid out system of tracks and dispatching, movement of materials through the plant takes place in an orderly manner.

Storage areas at various positions permit continuous operation of the departments. For instance, a storage area is provided near the continuous pickler, in the cold mill building, in the annealing department and in the supplementary rolling-mill department. In addition, a large storage area is provided between the hot mill and the cold mill under a craneway covering an area about 75 feet wide and 200 fe

The new continuous pickl has a number of unique f The pickle tank itself is 1 long and is of concrete an construction.

A new departure in coiling ment is seen in Figs. 2 and ing individual coiler units strip coming from the pick stead of the usual single simultaneously coiling the s strips passing through th this pickler employs six in

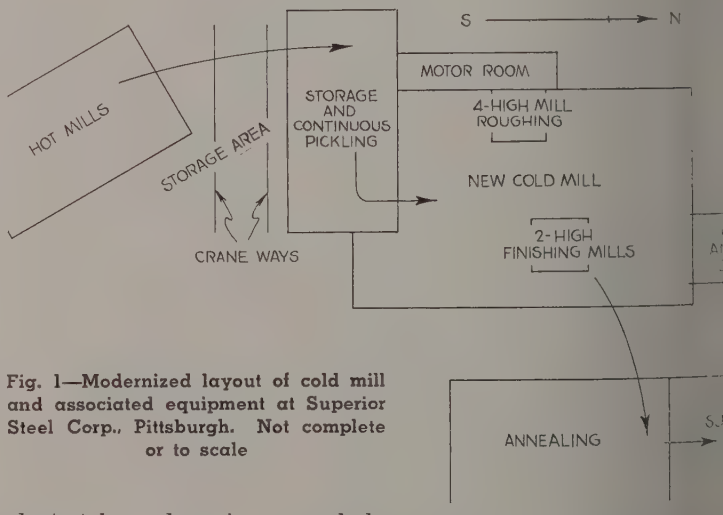



**Fig. 1—Modernized layout of cold mill and associated equipment at Superior Steel Corp., Pittsburgh. Not complete or to scale**

coiler units. The complete capable of handling strips to 30 inches in width at spee 15 to 60 feet per minute.

Maximum total width of passing through the tank inches. This means that two strips, three 20-inch strips, inch strips or six 2 to 9-inc can be handled simultaneou

The main advantage of rangement is that it affords

*You Really Ought to Know*

# MIKE

Mike is *some* watchman! Mike never needs a cup of coffee, has no curiosity; never gossips, never gets drowsy, never asks for a relief, never ducks for a smoke, never moves without authority.

Mike *really watches* heating operations in annealing, protective atmospheres and tin plate manufacture . . . and watches the gas bills, too! Mike is the micrometer adjusting wheel that controls the valve action of the Kemp Industrial Carburetor, which in turn provides 100 percent premixing of gas and air, allowing accurate control of flame pressure and flame characteristics, allowing flame application in enclosed chambers, *even in solutions* . . . with material savings in fuel. Like to hear more? Address **The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore, Md., or Oliver Bldg., Pittsburgh, Pa.**

**KEMP of BALTIMORE**

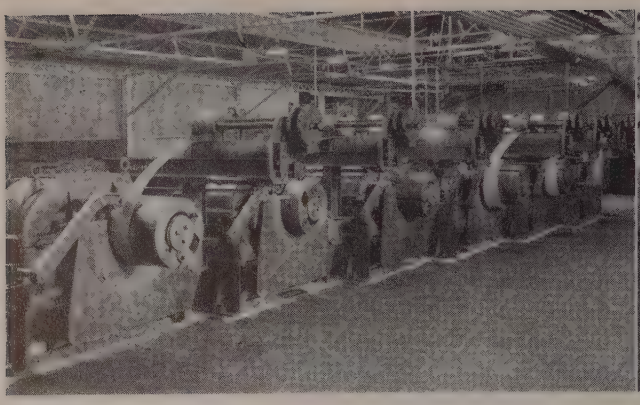


Fig. 2—Slow-speed end of coil-winding equipment, showing drums mounted directly on gearmotor shafts. Photo courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

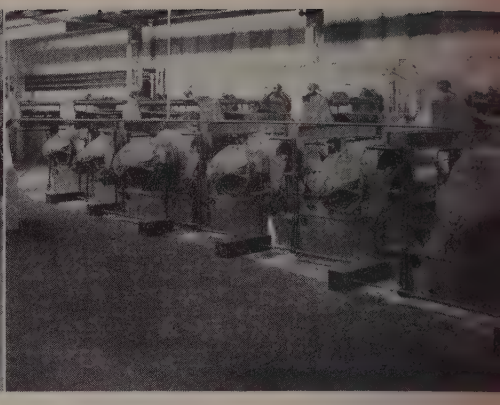


Fig. 3—Gearmotor side of re battery contains two 7½-ho two 10-horsepower and two power units. Capacities are and 6000-pound coils res Drums are 20 inches in diam courtesy Westinghouse El Mfg. Co.

more flexible setup since speed of any strip is not dependent upon speed of other strips. This means that different materials can be pickled simultaneously even though one material may require a slower speed than another since each of the coiler units is individually driven by its own motor and gear reduction which can be set to maintain any speed desired. Thus it is possible to handle different steels at different speeds simultaneously in the pickler.

Each of the six coiler units has its own rheostat rider arm riding on the coil so as the coil increases in diameter, speed of motor decreases automatically to maintain a constant strip speed through the pickler.

Speed of each individual coiler unit is adjusted by a rheostat mounted on the frame next to start-and-stop buttons and readily accessible from the operating side shown in Fig. 2. Of the four coiler units shown in this view, the one at extreme left and one at extreme right are in operation. The use of individual coiler units also permits more continuous operation of the pickler since it is not necessary to stop other strips when starting or removing a strip. This also simplifies threading operations through the pickler and permits maintaining maximum production from the unit. In addition, it allows one or two operators to handle the entire loading and unloading operations connected with starting and removing the coils at the coiler end since all the other units may be in operation while the operator is removing coils from any one of the units. This means that unloading operations can be staggered and so permits more efficient utilization of the operator's time.

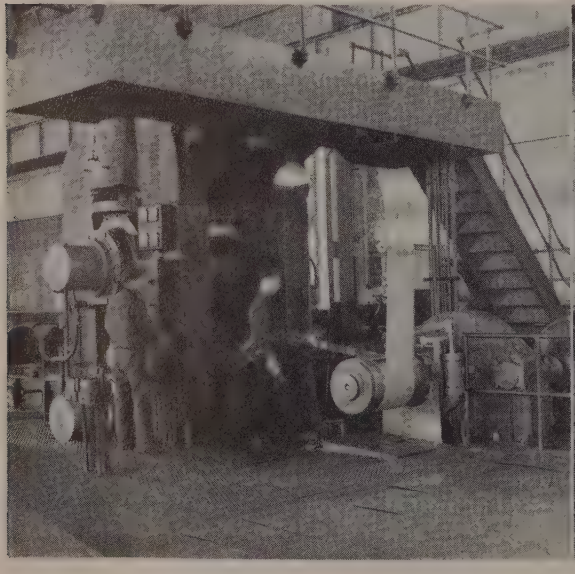
Fig. 3 shows opposite side of the coiler units. Here can be seen the individual motors with their integral gear-reduction units. Gear r is such that coiling speeds sible throughout a range speeds from 15 to 60 minute.

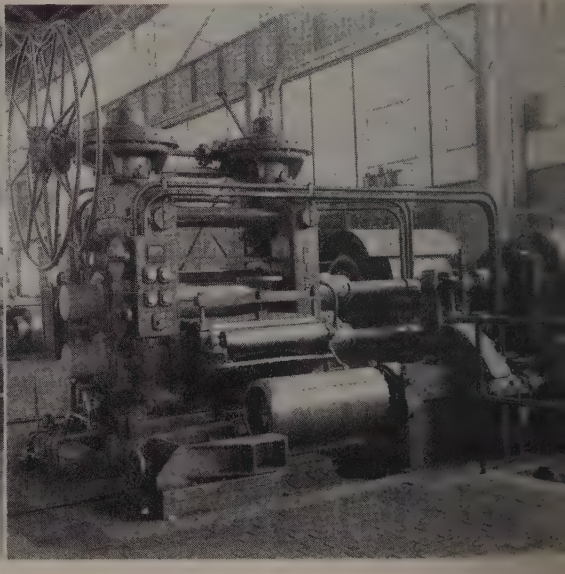
In the new cold-mill roo found a new 4-high mill of modern type. This unit is roughing operations and has mum strip speed of 600 minute. It is driven by a 10 power direct-current motor in the adjoining motor roo

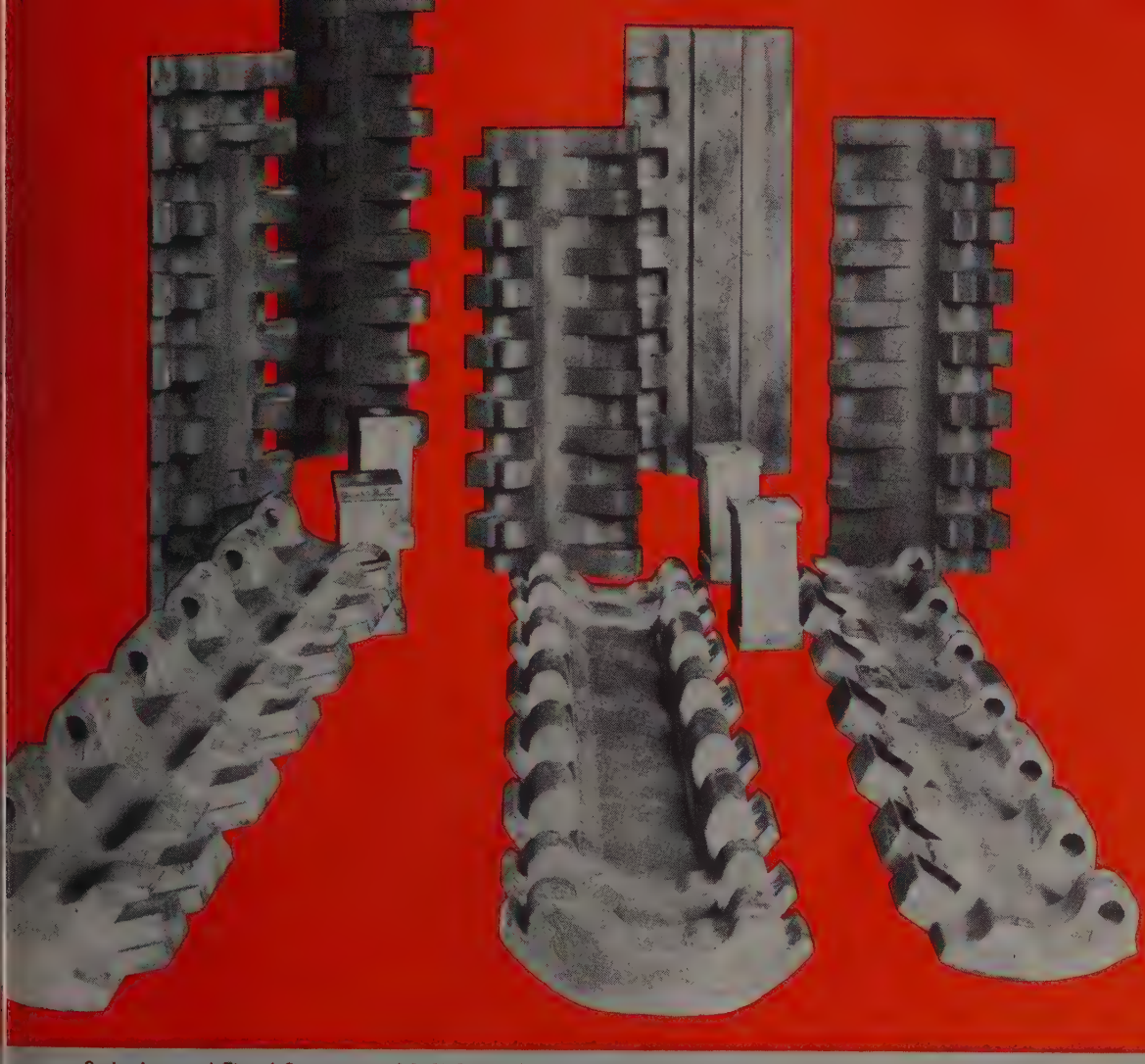
This roughing mill is us cipally in rolling stainless handles strips up to 30 i width. Larger proportion steel handled is in coils of up to 0.125-inch in thickn

Fig. 4—This new 4-high mill here is working stainless steel and winding paper in the coil to protect the finish

Fig. 5—Here is the new 2-h mill. A 200-horsepower motor at strip speeds up to 600 minute







Swinging and Fixed Segments of D-H-S No. 2 Bronze. Weight 1100 to 1800 lbs. each.

# D-H-S BRONZE

DUCTILITY · HARDNESS · STRENGTH

LONGER LIFE • LOWER COST

**-H-S No. 2 BRONZE**
**JM PHYSICAL PROPERTIES**

| | |
|---|---|
| ensile Strength (lbs. per square inch) | 115,000 |
| t (lbs. per square inch) . . . . . | 90,000 |
| it (lbs. per square inch) . . . . . | 55,000 |
| —per cent in two inches . . . . | 12 |
| of Area—per cent . . . . . | 12 |
| dness No. . . . . | 225 |
| Set under 100,000 lbs. per square inch | .020 |

*Recommended for applications where lineal speeds do not exceed 250 feet per minute.*

**Highest combination of balanced physical properties, found only in D-H-S Bronze**

**Superior for Reel Segments**

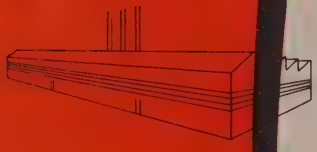
**COMPANY · BARTLETT HAYWARD DIVISION · BALTIMORE, MARYLAND**

O P P E R S *product*

The

# RIGHT ROLL

for every Mill



## NORMAL MILL CONDITIONS

| | Heavy Duty | Light Duty |
|---|---|---|
| Slabbing Mill | M-H Spec. Alloy St. | Hytensite |
| Blooming Mill | Technalloy AX | Technalloy A |
| Structural Mills: | | |
| Roughing | Technalloy AX | Technalloy A |
| Intermediate | Technalloy C | Technalloy D |
| Finishing | Technalloy E | M-H Grain |
| Merchant Mills: | | |
| Tandem Roughing | Technalloy A | Hytensite |
| First Roughing | Technalloy B | Hytensite |
| Intermediate | Technalloy C | Hytensite |
| Leaders | Technalloy D | M-H Grain |
| Finishers | Technalloy E | Nironite A |
| Continuous Bar & Billet Mills: | | |
| Roughing Mill | Technalloy C | Hytensite |
| Finishing Mill—Rgh. | Technalloy D | Hytensite |
| Finishing Mill—Fin. | Nironite C | Nironite A |
| Rod Mills | Nichillite No. 2 | Nironite A |
| Billet Mills—3-High | Technalloy B | M-H Grain |
| 2-H Strip and Hoop Mills: | | |
| Roughing | Nironite A | M-H Grain |
| Finishing | Nironite D | Nironite A |
| Sheet & Tin Mills: | | |
| Roughing | Technalloy A | M-H Grain |
| Hot Rolls | Mo Technichill | Mo. Technichill |
| Water Mills | Nichillite No. 2 | Mo. Technichill |
| Cold Rolls | M-H Composite | Nichillite No. 4 |
| 2- and 3-High Plate Mills | Nironite C | Nichillite No. 2 |
| Universal Mills | Nironite C | Nichillite No. 2 |
| Three-High Breakdown Mills | Technalloy B | Hytensite |
| Pipe Mills—Lap & Butt Weld, Seamless, Electric Weld: | | |
| Piercing | Machempite | Machempite |
| High Mill Pinch Rolls | Technichrome B (Adamite) | Technichrome B (Ada |
| High Mill | Technichrome B (Adamite) | Hytensite |
| Reeler | Nironite A | Spec. Chill |
| Sizing | Spec. Chill | Technichrome E (Ada |
| Reducing | Technichrome E (Adamite) | Spec. Chill |
| Expanding | Technichrome D (Adamite) | Spec. Chill |
| Finishing | Spec. Chill | Technichrome E (Ada |
| Planishing | Spec. Chill | Technichrome E (Ada |
| Welding | Technichrome B (Adamite) | M-H Grain |
| Straightening | Spec. Chill | Technichrome B (Ada |
| Forming | Spec. Chill | Technichrome E (Ada |
| Discs | Low Alloy Mild Steel | Low Alloy Mild Steel |
| Non-Ferrous Mills: | | |
| Hot Break Down | Mo. Technichill | Nichillite No. 2 |
| Cold Break Down | Technalloy AX | Technalloy A |
| Cold Running Down | Nironite B | Spec. Chill |
| Cold Finishing | M-H Composite | Nichillite No. 4 |
| Cont. 4-High Wide Strip Hot Mills: | | |
| Back-Up Rolls | Technalloy AX | Technalloy A |
| Scale Breaker No. 1 | Technalloy AX | M-H Grain |
| Roughing No. 1 Stand | Technalloy AX | Technalloy A |
| Work Rolls—No. 2 Stand | Nironite A | Mo. Chill |
| Work Rolls—No. 3 Stand | Nironite A | Mo. Chill |
| Work Rolls—No. 4 Stand | Nironite A | Mo. Chill |
| Scale Breaker No. 2 | Technalloy AX | M-H Grain |
| Work Rolls No. 5 | Nironite B | Nironite A |
| Work Rolls No. 6 | Nironite B | Nironite A |
| Work Rolls No. 7 | Nironite B | Nironite A |
| Work Rolls No. 8 | Nironite C | Nironite B |
| Work Rolls No. 9 | Nichillite No. 3 | Nironite D |
| Work Rolls No. 10 | Nichillite No. 4 | Nironite D |
| Edging Rolls | Technichrome B (Adamite) | Technichrome B (Adamite) |
| 4-High Tandem Mills, Temper and Skin Pass Mills: | | |
| Back-Up Rolls | Technalloy AX | Technalloy A |
| Work Rolls | M-H Composite | Nichillite No. 4 |

* Where requirements do not warrant the better roll.

**Motor room with 1000-horse-otor at left, high voltage equip-ment at right**

a view of the recoiling side mill. Here stainless steel worked and a paper filler is ound into the coil to pro- highly finished surface of erial.

ew 2-high finishing mill is n Fig. 5. This also handles d sheet up to 30 inches in t is used to finish material maximum thickness of h. A 200-horsepower direct- motor at speeds of from 200 revolutions per minute to drive this mill. Speed of be varied up to a maxi- 600 feet per minute.

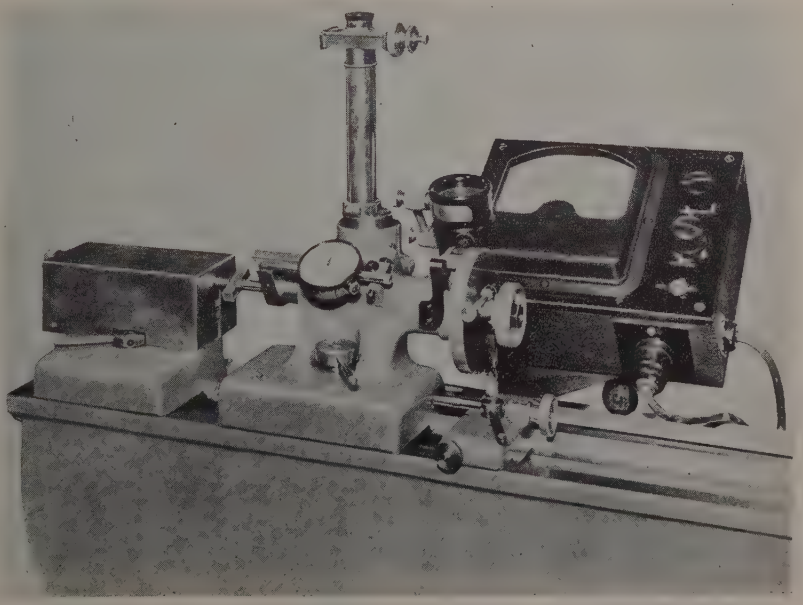
located in the main cold- m is a recoiler unit which material up to 30 inches in nd there is a cutting up a side trim shear leveller ing-up shear also a slitter. naller units are located in n.

room is 35 feet wide and long. It is immediately to the main cold-mill room. ows at left the motor driv- 4-high roughing mill in he motor is located in the motor room with the ending into the mill room. or is rated 1000 horsepower 250 to 750 revolutions per

extreme right in Fig. 6 seen the high-voltage pan- steel-encased switch gear he high-voltage equipment. the left of this control n be seen the large motor- set used to furnish the oltage direct current sup- the large cold mills. This nerator set is driven by a 1500-horsepower synchronous motor at 720 revolutions per minute. The main direct-current generator is rated 600 volts at 1667 amperes. There are two other auxiliary direct-current generators in this set.

At the far end of the motor room in this view part of the motor-generator and control used with the six coiler units of the pickling line is visible. Each of the six motors driving coilers receives current from an individual generator at variable voltage. All six of these generators are connected together and driven by one motor.

**Electric tailstock gage with power unit mounted on measuring machine. View shows gage block between head-stock and tailstock spindles**



# Millionths of an Inch in Gage Room

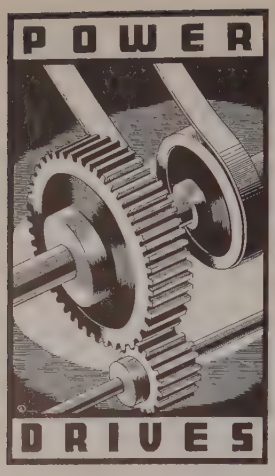
■ DIFFERENCES as small as a millionth of an inch can be compared electrically through the recent application of an electric gage head to the tailstock of a Pratt & Whitney measuring machine in the tool and gage department of General Electric Co., Schenectady, N. Y.

Essentially this machine consists of a heavy bed plate with a movable headstock toward the right end and at the left a movable tailstock equipped with an electric gage. Differences in length over 0.00001-inch are measured mechanically at the headstock, but finer differences are measured by combination of the tailstock and electric gage.

Parallel to the V-flat ways of the machine is an 80-inch bar in which is inserted a steel measuring button at each inch. On the polished surface of each button is a finely scribed line, precisely located with reference to the line on the zero button at the left end.

Mounted on the headstock is a microscope with two parallel hairlines for use in positioning the headstock with reference to a given line on the bar. A micrometer screw adjusts the headstock spindle and makes possible vernier readings to 0.00001-inch.

Head of the electric gage is mounted on the tailstock in such a way that gage spindle is also the tailstock spindle. This arrangement makes the gage-head spindle responsive to slightest variations in gaging pressure.




# Punch Press Drives

**Variable speed transmissions quickly repay their cost by higher operating speeds and increased production they make possible. Also permit adjustments to be made easily when setting up dies since press speed can be reduced to 1/8 full speed**

■ SPEED NUT division of Tinnerman Stove & Range Co., Cleveland, with a capacity of some 200,000,000 Speed nuts annually, uses various sizes and types of punch presses in stamping and forming operations involved in production of these prices from strip steel stock.

Speed nuts are manufactured in more than 300 different shapes and sizes for many different applications. Manufacturing operations range from simple stamping and upsetting on a small punch press to large 4-slide machines handling the more complicated punching and forming operations. These machines can roll up a complete circle when set up for such a sequence of operation. The small punch presses operate at extremely high speed. Details of Speed nut manufacture, material from which they are made, size range, etc., were presented in a previous article, (see STEEL for March 28, 1938, p. 46).

A number of drives to these punch presses were fitted with Reeves variable-speed transmission units. Object was to adjust speed of the press according to size of the strip stock being handled and amount of work being done on the strip. Extreme accuracy is most essential in forming Speed nuts. There must be no burrs on the raised points or other parts of the Speed nut.

### Study Press at Slow Motion

Variable speed drives also were found to aid in setting up dies as the units employed permit a speed variation of about 8 to 1. Thus press speed can be slowed down when setting up a die so the action can be seen clearly and studied carefully. This makes it infinitely easier to take out "bugs" in operation dies and so greatly facilita ting up the dies.

As seen in Fig. 1, most presses include a roller lev rangement to straighten th stock before it enters the pre unit is shown here at the left. Next in line is the knuck positive, reciprocating feed advances the strip into the each stroke of the press. Sin dies in most cases are of gressive type, where from eight stages may be used to the various slitting, punchin ing, upsetting and shearing tions, it is extremely importa the reciprocating slide fee anism operate with great a This means in setting up th tions that the ability to op press at extremely slow spe great value in making the n adjustments and preventing age of dies during prelimina ations. Then as the die a adjusted more accurately, t of operation is stepped up g until maximum is reached.

### Air Aids Removing W

In most instances the facto ly limiting speed of operatio ability to remove work from to prevent jamming. As a preventing jamming, an air used on almost all the pr clear completed work from The air blast does not run ously but is synchronized v press.

Operation of the dies a improved by inclining the

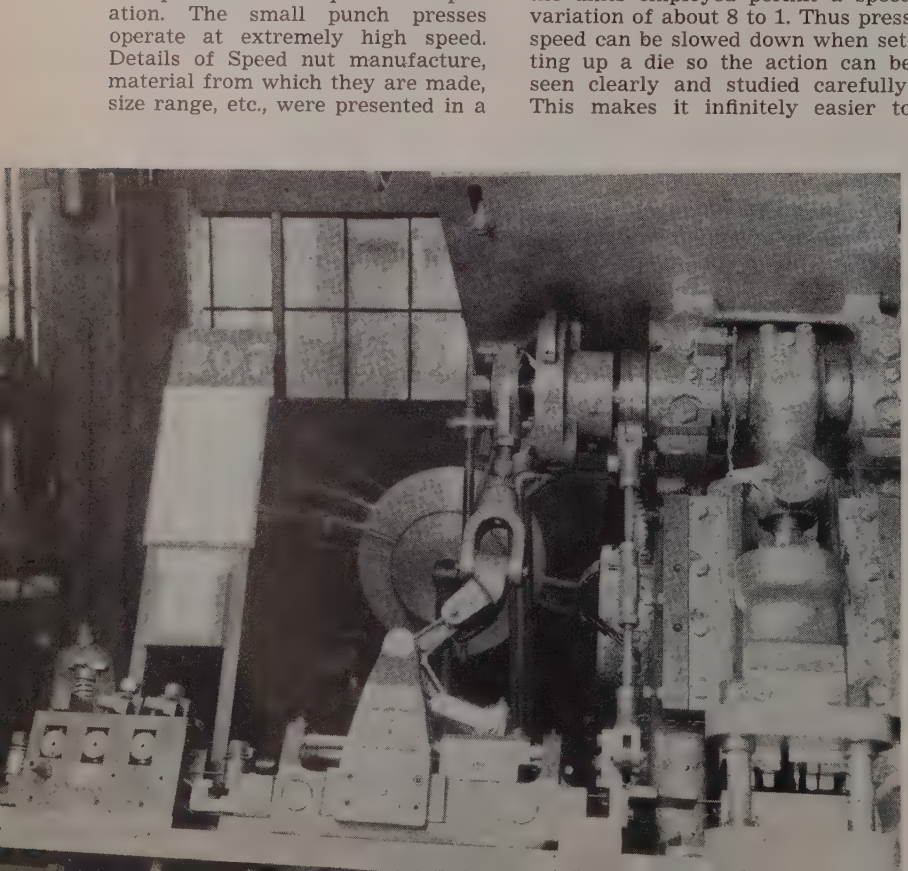


**Fig. 1—Typical setup with rolle reciprocating slide feed, a strip clamp and progressive in line from left to right w traveling from coil at l**

# How Zirconium helps make sound 12 to 14% Chromium Steels

ZIRCONIUM is being successfully used as a final deoxidizer in 12 to 14 per cent chromium steels. This treatment thoroughly cleanses the steel, helps remove dissolved gases, and eliminates pinholes and porosity in ingots and castings. A sound, dense steel results. The form of zirconium most effective for this purpose is 35 to 40 per cent zirconium alloy.

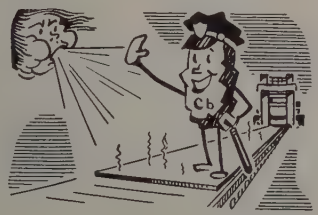
Ask to have one of our metallurgists call and explain further how you can improve your 12 to 14 per cent chromium steels with zirconium. He will gladly help make your use of this and other "Electromet" ferro-alloys profitable, without obligation. Electro Metallurgical Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

## ems of Interest t other "Electromet" Ferro-Alloys

**Nitrogen Ferrochrome Im- s High-Chromium Steel ngs** — High-nitrogen ferrochrome th nitrogen and chromium to steel. per cent of nitrogen in cast steels ing over 20 per cent chromium refines grain size, inhibits objec- grain growth at high temperatures, ly increases strength and toughness cts a slight increase in hardness.

**m-Manganese-Silicon Elim- Pinholes** — In repeated tests, manganese-silicon used as a ladle er has proved beneficial for coun- gases which penetrate the steel is being cast. The elimination of these gases reduces the formation of pinholes in the castings.

**Use Columbium to Counteract Air-Hardening in Plain Chromium Steels** — Columbium in small amounts in wrought plain high-chromium steels counteracts air-hardening. As a result the steels are soft in the hot-rolled condition. The annealing period required to further improve the properties of the metal is shorter than when no columbium is present.




**Chromium Gives Longer Life to High-Manganese Steel Castings** —The addition of 1 to 3 per cent chromium to 12 per cent manganese-steel castings increases the initial hardness, which is desirable for wear resistance where impact is not severe enough to work-harden plain manganese steel.

**Calcium-Silicon Improves Electric Furnace Steels** — Calcium-silicon used as a ladle deoxidizer in wrought steels made in the electric furnace increases the soundness of the steel and improves its hot-working properties.

**Columbium or Titanium Widens Use of Austenitic Stainless Steels** — When austenitic stainless steels contain columbium or titanium, they are free from intergranular corrosion even after being held at temperatures ranging from 750 to 1,650 deg. F. for long periods. It is possible to use these steels without annealing after welding with columbium-bearing welding rod.

• • •

If you want more information about these and the many other "Electromet" ferro-alloys and metals and the service that goes with their purchase, write for the booklet, "Electromet Products and Service."

**Electromet**
Trade-Mark
**Ferro-Alloys & Metals**

The word "Electromet" is a registered trademark of Electro Metallurgical Company

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

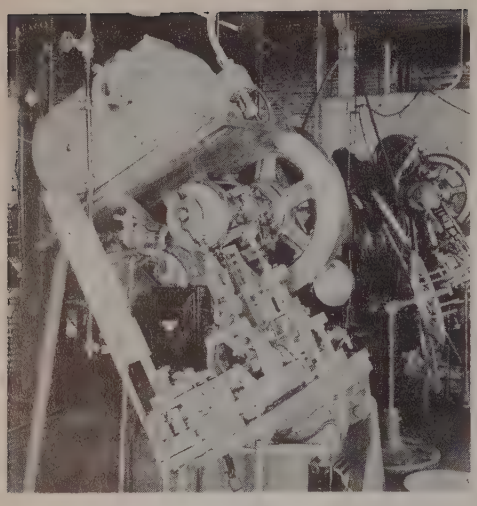


Fig. 2—Showing variable speed transmission and motor mounted on top of press. This is same setup shown in Fig. 1. Note press is inclined to provide better clearance of work

to a considerable degree. In fact, two of the presses have been changed from vertical type to horizontal type to take advantage of the force of gravity in clearing the dies of material. It is expected other presses will shortly be changed over to horizontal type for this same reason.

Fig. 2 shows one of the inclined presses with multiple roll straightener, reciprocating slide feed mechanism and progressive dies. Motor and variable speed transmission are mounted on a platform at the top of the press. In Fig. 1, various parts of the progressive die used on this particular job can be seen between the two posts or guide pins of the die at the extreme right of the pic-

Fig. 3—These 4-slide machines are connected to the variable speed transmission through a flat belt. Driving motor is connected directly to transmission unit

ture and just below the ram of the press. This press also is equipped with a holding mechanism which firmly clamps the strip between feeding operations. This unit can be seen between the reciprocating feed mechanism and the dies. Stationary part of this die totally encloses the strip passing through it and has openings in the top portion through which the various cutting and forming tools operate. Five of these cutting and forming tools may be seen at the extreme right in Fig. 1.

Figs. 3 and 4 show 4-slide presses which apply force to the work from four directions. These machines are capable of forming a complete circle if desired, and their extreme flexibility permits making special Speed nuts for particular applications, some of these Speed nuts being quite intricate in formation. All of the 4-slide presses and all the new presses being installed in this plant are equipped with variable speed transmissions.

### Permit Raising Speed

These transmissions not only permit adjusting dies and feeds when setting up the press but also permit raising the speed to where one or more limiting factors come into play. In actual operation, the speed of a press is increased gradually and the quality of the work checked carefully to see that it remains uniform. When too high a speed has been reached, the operation of the dies is not uniform so speed is adjusted just below this point to where the forming operations are uniformly accurate and there are no burrs or fins on the cut edges.

Another factor limiting maximum speed is the possibility of breaking the dies or damaging the fine edges of the dies. However, the variable speed transmissions do permit the highest possible speed coincident with safe operation.

Some idea of the excellent results obtained by use of variable speed transmission units in this plant can

be obtained from the follow
ures.

On a small high-speed pre
for punching, forming and
off of small Speed nuts in or
ation, former speed was
strokes (14,000 Speed nut
hour. With the variable spee
mission, it was found possibl
crease this to 18,000 per hou

On another press where
gears had been employed pre
the highest possible operatin
appeared to be 9000 strok
hour. However, with variabl
transmission it was found
to increase this speed to
strokes per hour and still
high quality work.

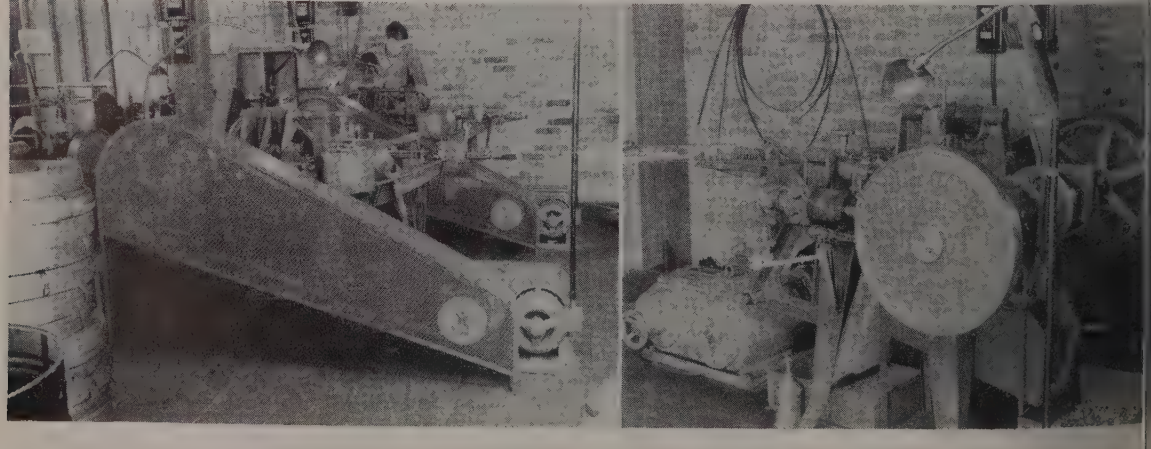
Production on the 4-slide m
jumped from 7000 per hour t
per hour when the variable
transmission units were insta
this instance the extra 24,000
produced per eight-hour day a
mated to increase earning po
each machine about $10 p
This means the installatio
quently pay for themselves
90 days. After this the increas
duction is added return fr
equipment.

Results of using variabl
transmissions at this plan
been so satisfactory that it h
decided to install them on
presses and possibly on more
older ones.

## Metal Cutting Anal

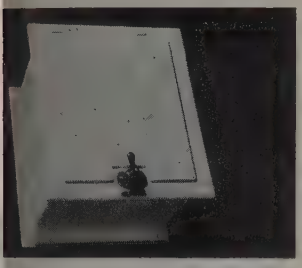
■ Metal cutting and chi
studied and pictorially prese
"Physics of Metal Cutting" b
Ernst. Illustrations of stres
bution, diagrams, and phot
graphs are used in an ur
clear treatment of the
Copies of the pamphlet may
tained from Cincinnati Milli
chine Co., Cincinnati.

Fig. 4—Another 4-slide unit. Th
chines handle complicated form
erations. Here variable spee
missions easily pay for thems
90 days



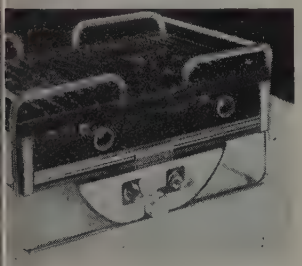
# W METAL PRODUCTS

w steel milk and package constructed of pressed steel trically welded has been de- by Majestic Co., Hunting- . Inner door has refrigera- lock and handle which be opened from outside. door has knob and bullet-



ch which keeps door firmly Receiver body is 12¾ inches 10¾ inches high. Inside side of receiver are finished mar-proof enamel.

arine stove with streamlin- uring sturdiness as well as s has been designed for llis Co., 91 Chambers street, rk by Designers for Indus- , Terminal Tower, Cleve- tove features the use of m plated tubing for legs unhampered air circulation

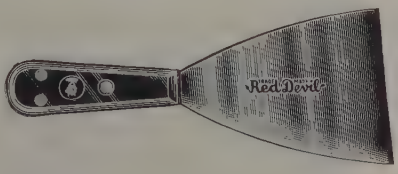


base and tank and elimina- grease and dirt catching A new type guard rail use of larger utensils and em on grill during rough Mechanical improvements positive quick-lighting burn- nonwarping top grill.

treamline automatic iron ker" has been added to

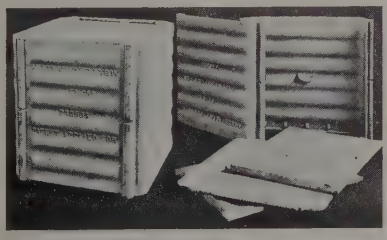
line of household appliance of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Iron has a heat-control lever marked with names of fabrics so that right heat for any fabric may be selected. Base is constructed in such a way as to keep heat concentrated in ironing surface, making top and handle much cooler. Iron has fatigue-proof sloping handle, weighs five pounds, has 115-volt heating element rated at 850 watts. Six-foot detachable cord has soft rubber attachment plug. Iron can be operated only on alternating current. Approved by Underwriters' Laboratories.

■ Putty knives and wallpaper scrapers featuring streamlined handles of red tenite and blades of mirror polished tool steel have been announced by Landon P. Smith, Inc., Irvington, N. J. Tenite cannot chip, split or break. Red color



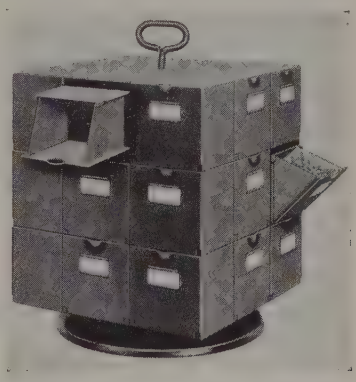

makes the tool easy to find when misplaced. Steel handles are permanently locked in tenite by solid brass compression rivets. Knives and scrapers are available in stiff and flexible models with 1¼, 1½ and 2-inch blades for knives and with 2½, 3, 3½ and 4-inch blades for scrapers.

■ Sectionalized heat treating boxes manufactured by American Manganese Steel division, Chicago Heights, Ill., mechanically avoid stresses set up by contraction and expansion resulting from rapid heating and cooling. Boxes do not



allow any appreciable gas leakage at vertical joint. Ends are made with vertical grooves into which fit corresponding tongues on side castings. Matched slots in both tongue and groove hold pins to prevent relative vertical movement of parts. Sufficient clearance between tongue and groove allows for expansion and contraction thus avoiding distortion or cracking. Sections of boxes are easily and quickly replaced at fraction of cost of replacing an entire box.

■ A revolving assembly of welded steel bins in one compact unit, made by Noggle Products Co., Ann Arbor, Mich., is available in a unit containing 24 bins each 3 x 3 x 2½ inches or 24 bins each 4 x 4 x 3 inches. Double width bin can be



substituted for any pair of single width bins. Bins are 26 gage steel, spot welded and finished in green.

■ Stainless steel grounding resistor announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., operates at high temperatures outdoors. Rapidly rising resistance value, because of rapid heating, decreases fault current and places less stress on resistor. Resistor cools quickly and is suited for frequent operation.

■ Electric operators for single-leaf swinging gates are announced by Barber-Colman Co., Rockford, Ill. It also operates a latch which automatically locks gate when in closed position. Operator has heliocentric speed reduction, limit switch, adjustable friction clutch, latching mechanism and is available in two models, Q and QR. Model Q requires constant contact of central station while Model QR is equipped with a relay and requires but momentary contact. Latter model can be controlled by driveway plate or by radio control.

## Classifying

(*Concluded from Page 54*)

warehouse from rolling mills, classified, placed in stock and stock sheets sent out to prospective customers at intervals of two weeks. Two stock lists, one on tin mill black plate and one on tin plate, each showing about 400 different items, are sent out. Material goes to some 150 different manufacturers, the largest consumers among whom probably are manufacturers of containers, toys, signs, metal cabinets, boxes and lithographed articles of all kinds. On orders for material in larger quantities than available, the material is allowed to accumulate in the warehouse until the orders can be filled. About 60 per cent of the material going through the warehouse is black plate and 40 per cent tin plate.

When Tin Mill Products Corp. moved from an old building to the new warehouse at 3411 Smallman street, Pittsburgh, the floor space was increased about 50 per cent to accommodate increased volume, and a study was made to increase efficiency of handling operations in the warehouse as a comparatively small difference in handling costs greatly influences the total cost of doing business since handling includes such a large portion of the work done.

The result was that the power truck was purchased. An actual saving in handling costs, amounting to 50 per cent of the former figure, has been experienced. This significant reduction in costs has been most gratifying.

Most customers of this warehouse are out of town, and shipments leave the warehouse via highway truck and rail, about evenly divided as to quantity. Thus the material enters the warehouse at the north end, is classified and stocked, and leaves out of the south end where trucks haul it away.

In most instances, the highway trucks employed have strong enough floors to permit running the power truck and its load directly into them. This greatly facilitates loading as it eliminates fatigue and effort connecting with hand loading operations. Usually these highway trucks have canvas tops which can be removed to provide sufficient clearance for the power truck. Then with the highway truck backed up to the loading platform and a connecting plate laid, the plant truck easily deposits the sheet packs where desired on the truck floor.

### Pushes Packs on Trucks

Sometimes, however, floors of highway trucks are in such poor condition that it is inadvisable to run on it with the plant truck with its load. In such a case, the sheet packs are deposited on the rear end of the highway truck as shown in Fig. 4. Then the power truck is employed to push the sheet packs forward as shown in Fig. 5. Power truck can exert a pushing force of 4000 pounds before the wheels will skid. With a load on the forks to hold the wheels to the floor and increase their grip, a large may be exerted. Of course, instances only a few pounds of force are necess slide the sheet packs forw the truck. While this met loading trucks does not uti speed and ability of the motor most efficiently, it doe the extreme versatility an bility of these units.

•

## Insulating Firebrick In Soaking Pit Cove

■ A number of steel compan using insulating firebrick to creasing extent in soaking p ers, according to Babcock cox Co., 85 Liberty street, New This is because such const lightens cover structure wi sulting economies in handlin ers and reduced damage to work, and also because suc ers have long service life as sequence of their low heat s capacity and low thermal c tivity.

A 5-foot 6-inch by 14-foot cover on a pit operated at 2 grees Fahr., and fired wit ducer gas heating 20 to stock in approximately lengths, operated continuous five months before any repair necessary. These first repair directly attributable to carele dling of cover but were not s With occasional repairs, this was in service 38 months being rebuilt. In the same heavy firebrick had requi pairs after 3 months and g overall service life of only 8 m

Another company rebuilt a ing pit by removing the d wall between two pits and their two 7 by 9-foot cov gether. As existing equipme unable to lift the resulting 18-foot cover when heavy fi was used, insulating firebric employed. This cover has service for more than 18 and gives promise of long li three other such 7 by 18-fo four 7 by 9-foot covers also use in the same plant.

Some soaking pit covers insulating firebrick have bee using frames designed for firebrick. In these and other lations sprung arch const has been used with satisfact sulating firebrick also perm of a flat suspended roof co tion in which the brick, p drilled, are "threaded" ont which are suspended from s ing members. This constructi mits easy and quick repair placement of the cover whe essary.

## g Aluminum

ncluded from Page 56)

y with the purer grades like 3S. Plated 2S sheet may be and formed even in crimp- without demonstrating the idency to lift or peel at the f stress.

luminum die castings, sand and wrought or extruded ay be plated. In any event, ing shows great resistance to heat as high as 600 de- hr. and to salt spray tests. turers have found that ch of nickel will withstand as 300 hours on salt spray

of the present process are d against employing strong cleaners since these may ching which is not needed. clean metal surface is re-

astman Kodak Co., Roches- ., has a typical installation rocess. It is used here to ie-cast aluminum camera his work involves a 15-kilo- nsformer with a tapped sec- o the current during anodiz- be built up gradually to amperes per square foot. of the equipment is made o standard tanks and the us- r rinses.

•

## sis of Three- nsional Strains

thod for analyzing three-di- l strains on heavy machin- se of a beam of polarized transparent models has veloped by Royal Weller, te university, Columbus, O. t beam is focused on the hich is surrounded by oil of roperties identical to that odel. Model scatters beam angles to original light ray duces a visible pattern effect is a cross-section of

bands of light, magnitude tion of stress on model can mined by simple calcula- Chief advantages of this re claimed to be: The pat- y be photographed for a nt record; since no heating g are involved, uncertainty al constants is eliminated heory of superposition may rotating the model gives ection and principal values, inates complex calculations with a cut model; model have to be destroyed; ac- interior points seems bet- that obtainable by slicing

## HANDLED WITH A YALE ELECTRIC TRUCK

7,500,000 lbs.—3,750 tons . . . A lot of tonnage in any man's language. Yet that's what one operator using a Yale High Lift Electric Truck is able to handle in 3 months for the Atlanta Plant of the King Plow Company.

And the units to be handled are not standard in size or shape. They run the gamut from metal scrapes to the heaviest die cuts. A real handling job if there ever was one.

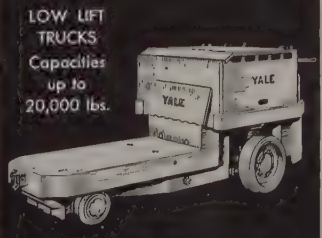
Here's what the King Plow Company has to say about their Yale Electric Truck:

**"This truck does a 4-5 day job in 11 hours . . We find many jobs for this equipment which it was not originally installed to do . . . Almost before it was put to work it paid for itself . . . This truck never hesitates even for the longest and steepest ramps . . . It is indispensable—has saved substantially."**

***Indispensable—Never hesitates—Saved substantially*** . . . these words means saving and efficiency to the King Plow Company. And they can mean the same to you—for the Yale Electric Truck always conforms to the same service standard—the best.

It has to. Its drive units are more powerful . . . its construction is stronger—its engineering is more advanced. More than just a truck—the Yale Electric Truck is a mechanical efficiency expert! Send for free catalogue giving full information.

Trained sales engineers are located in 56 major industrial centers ready for instant service. Consult your classified directory.

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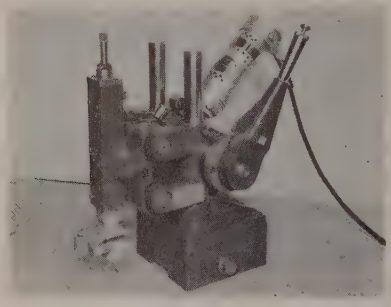
YALE TRADE MARK

THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
IN CANADA: ST. CATHARINES, ONT.

## Superfinishing Machine

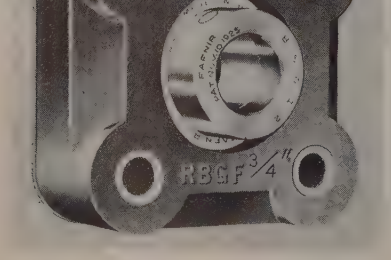
■ Foster Machine Co., Elkhart, Ind., announces a general purpose superfinishing machine for cylindrical surfaces up to 4 inches in diameter and 18 inches in length, and 6 inches in diameter on shorter lengths. Headstock may be equipped for center, collet or chucking work. Transmission is arranged for an infinite number of spindle speeds up to approximately 550 revolutions per minute. Readings as low as 2 millionths of



an inch are obtainable. Unit detects and removes surface defects, eliminates wear and gives a bearing surface said to be 5 to 10 times smoother than finish obtainable by other methods.

## Rubber Cartridge Units

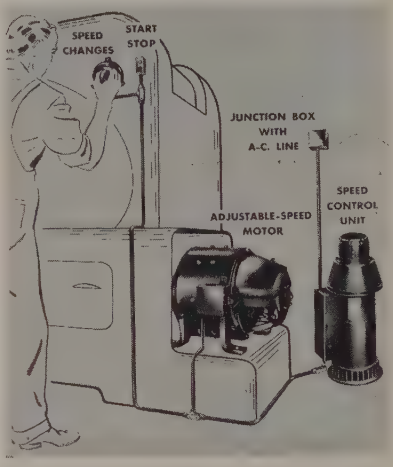
■ The Fafnir Bearing Company, New Britain, Conn., has developed flange and cylindrical cartridge




units. Completely resilient housing insulates bearing, absorbs noise, vibration and automatically compensates for small errors of alignment and longitudinal shaft-expansion. Units are available for all standard shaft diameters from ¾ to 1 7/16 inches and embody wide inner-ring ball bearings with exclusive self-locking collar.

## Adjustable-Speed Drive

■ Reliance Electric & Engineering Co., 1088 Ivanhoe road, Cleveland, has developed an all-electric, alternating-current, adjustable-speed drive, for motor users having only




an alternating-current power supply, consisting of a control unit and adjustable-speed direct-current motor applied directly to machine to be driven. Unit is supplied for 3-phase, 60 cycle, 220, 440 and 550-volt alternating-curent circuits. Unit varies speeds on small motors (1 horsepower and up) over as much as a 12 to 1 range by variable voltage control. Speed can be changed while motor is operating. Quick stopping is obtained by regenerative braking. Ample torque capacity provided eliminates necessity for clutches. Three screws fastening unit base to floor or other support make careful leveling unnecessary. Packaged control set for 7½-horsepower motor occupies floor space 18 inches square.

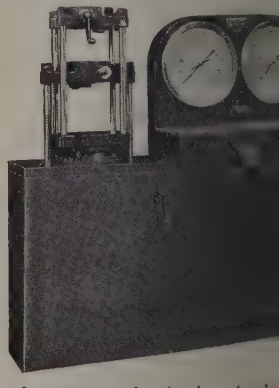
## Steam Generator Tube

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has developed a steam generator tube with thermal efficiency of 90 per cent. Heating coils are directly immersed in water, and unit can generate superheated steam from cold water in less than fifteen seconds. One thousand, 1500 and 2000-watt sizes, with evaporating capacities up to 5.7 pounds of water per hour and steam superheated to 350 degrees Fahr. are available. Boiler is 9¼-inches long, is made of trans-

parent glass capable of wi
ing internal pressure of 25
per square inch. Resistan
coiled on an insulating cor
leaves space for only 5 ou
water.

## Testing Machine

■ Tinius Olsen Testing
Co., 500 North 12th street
delphia, has put on the m
moderately priced, L-Type h
testing machine with a cap
20,000 to 60,000 pounds.
piston supplies necessary
strain. Gear pump is di
nected with constant o
speed which, when load is
produces no measurable p
Testing speeds range from

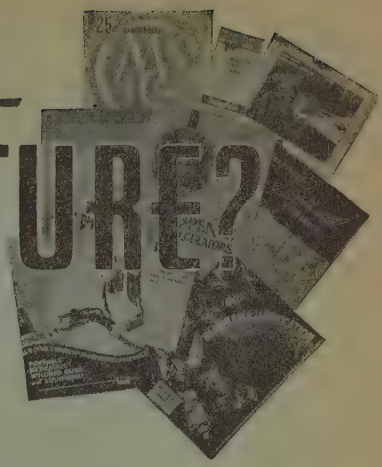


inches per minute in steple
vals. Indicating gages ar
separate instrument panel.

## Spot-Tamper Comp

■ Ingersoll-Rand Co., Phill
N. J., offers its model 55 sp
per with a single-stage 3-

# Have You Seen This HELPFUL LITERATURE?



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### ıst Prevention

. B. Sipe & Co.—4 page il- l bulletin No. 2071-7344. "Kil- lution, a fluid compound, pen- and film forming, for use :d metal surfaces, is easily ap- an anti-rust preparation or in tion with color pigments, ixed paints and metallic paints. with "Improvobond," it fully protective coating against n.

### aterials Handling

effrey Manufacturing Co.—960 ustrated general catalog No. l information on conveyors, , chains, sprockets, transmis- chinery, electric vibrating feed- ens, coolers, dryers, crushers, ers, shredders, portable load- , and gives full specifications ensional information.

### pper Roofing

Copper & Brass Inc.—44 page d booklet No. 6. Copper roof- flashings are discussed and in- n presented on architectural l specifications. Cross sections tual installations as well as plans.

### niversal Balancer

r Manufacturing Corp.—6 page d bulletin No. 751. The "Hi- tic universal balancer balances duct easily, rapidly and ac- Available in a wide range and with direct reading levels.

### (5)—Power Cable

Anaconda Wire & Cable Co.—56 page illustrated bulletin No. C-42. Description, applications, physical and electrical properties of rubber insulated power cables, together with methods of proper selection of cables are covered. Other Anaconda products and technical data pertaining to conductors are included.

### (6)—A. C. Motor Control

The Electric Controller & Mfg. Co. —8 page illustrated bulletin on the newly announced frequency relay magnetic control for A. C. wound-rotor motors. Describes the new unit and its applications in numerous industries and for applications requiring matched motor acceleration torque and load demands.

### (7)—Variable Speed Pulleys

Lewellen Manufacturing Co. — 12 page illustrated catalog No. 40. Variable speed motor pulleys for speed control where space is limited or where it is neither necessary nor practical to use variable speed transmissions. Specifications, tables of ratings and construction details are given.

### (8)—Arc Welder

The Lincoln Electric Co.—4 page illustrated bulletin No. 314-A. The 150 ampere "Shield-Arc Junior" welder with self-indicating dual continuous control, in either portable or stationary type, is fully described. Available for either 50 or 60 cycle operation.

### (9)—Welding Helmet

American Agile Corp.—Illustrated bulletin supplement No. 121. This light weight fully adjustable helmet affords maximum protection to face, head and neck and incorporates the "Agile" mirror welding lens. This lens protects against ultra-violet rays, increases visibility up to 42 per cent and permits closer inspection of welding arc progress.

### (10)—Conveyors

Mathews Conveyer Co.—384 page, plastic bound, pocket size handbook No. HB39, for engineers and plant operating men. Engineering data, specifications and operating data on all types of conveyors are covered. Typical layouts are shown. Cross indexed for reference.

### (11)—Agitator

The Patterson Foundry & Machine Co.—4 page illustrated bulletin on the new streamlined "Unipower" agitator, built in sizes from ½-H. P. to 100 H. P. and in a wide range of output speeds. Quiet operation and freedom from vibration are claims made for this new unit.

### (12)—Speed Reducers

Stephens-Adamson Mfg. Co.—8 page illustrated catalog No. 7838. Engineering information, specifications and operating data on "SACO" speed reducers are given. Furnished in 4 sizes, with or without V-belts and with output speeds of 14 to 176 RPM.

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# HELPFUL LITERATURE

### (13)—Refractories

J. H. France Refractories, Inc.—3 illustrated bulletins. Information and description of characteristics of "Nonspall" fire brick, "Franco-Plastic" fire brick refractory for one piece furnace lining, "Hydrecon" hydraulic refractory concrete, and "Corindon Base" high temperature morters, the latter material available in three forms, dry air-set morter, ready mixed air-set morter and dry-set morter.

### (14)—Impactors

Pennsylvania Crusher Co.—16 page illustrated pocket size bulletin No. 6000. Impactors as described are designed for reduction of minerals, stones and refractories to minus ⅛-inch with minimum of 100 mesh degradation, from sizes up to 5 and 6 inches. The principle of these units is that of shattering by direct impact, or batting.

### (15)—Die Heads

Landis Machine Co., Inc.—14 page illustrated bulletin No. F-90. "Landmatic" die heads for turret lathes, "Lanco" heads for bolt threading machines and "Landex" heads for automatic screw machines, all heat treated, are fully illustrated and described. Advantages are given and full explanation of use covered.

### (16)—Presses

The Minster Machine Co.—4 page illustrated bulletin No. 138. Open back inclinable presses in 9 sizes, and in fly wheel or single geared types are fully covered by specifications and descriptive information. Design and structural features are covered.

### (17)—Protective Coating

The Watson-Standard Co.—4 page illustrated bulletin on "Plicote" corrosive-proof protective coating. This new resin base coating applied like paint protects against most acids, alkali, brines, gasoline and fruit and food acids.

### (18)—Power Transmission

Link-Belt Co.—272 page illustrated book No. 1600. Handbook containing complete design and application data, dimensions, weights, list prices and cross-indexing for design engineers and plant managers. Bearings, clutches, gears, pulleys, safety collars, shafting and couplings, hangers and base plates are covered. The Twin-Disc line of clutches recently acquired by Link-Belt is included.

### (19)—Motor Drives

Quality Hardware & Machine Corp.—8 page illustrated bulletin. Individual motor drives for all types of machines to replace overhead line shafts are shown. Descriptions, horsepower requirements and prices of individual drives for lathes, shapers, milling machines, turret lathes, punch presses and drill presses are given.

### (20)—Alloy Tubes

The Babcock & Wilcox Tube Co.—Illustrated technical bulletin No. 12. Condensed technical data on high-temperature steels, seamless alloy tubes and pipe for high pressure and temperature services. Full discussions of characteristics of 15 different materials are included.

### (21)—Explosion-Proof Motors

Allis-Chalmers Manufacturing Co.—4 page illustrated leaflet No. 2125-C. Construction and installation views, showing explosion-proof motors in a variety of dangerous applications, and information on their use in explosive, fume-laden atmospheres are covered.

### (22)—Cleaning Machinery

N. Ransohoff, Inc.—24 page illustrated booklet No. 40. Washing, rinsing, drying, burnishing and pickling equipment for cleaning of metal parts are illustrated and described. Design and structural details are outlined and a partial list of users is included.

### (23)—Turbine Generator

Westinghouse Electric & M
turing Co. — 48 page plastic
illustrated booklet No. B. 210
seven principal types of turb
sizes up to 10,000 kilowatts, w
alternating and direct-current
ors, as well as exciters and re
gears are covered. Installation
cross-sectional illustrations an
color charts showing the lub
system, governor and other
equipment are included.

### (24)—Tool Storage

Lyon Metal Products, Inc.—
illustrated bulletin No. 175. V
accessibility and compactness
sirable in tool room storage
steel equipment illustrated a
scribed is designed to inc
these features. Numerous tool r
stallations are shown and the fl
of the units is illustrated in

### (25)—Molybdenum

Climax Molybdenum Co.—
illustrated loose leaf bulletin
denum in Gray Iron." Includ
on the use of molybdenum
strength irons and its effect
properties of cast iron in hea
tions. This is section 5 of a s
related booklets.

### (26)—Sandblast Cleaning

Ruemelin Manufacturing C
page illustrated bulletin No. 3
full line of sand blast generato
50 pounds to 2000 pounds,
cessory equipment are descri
partial list of users is included.

### (27)—Materials Handling

Towmotor Co.—24 page ill
bulletin No. 16. Action pict
latest materials handling meth
ing gas power industrial truc
lift trucks show the varied
tions and flexibility of these u

### (28)—Draft Gages

The Hays Corporation—4
lustrated bulletin on dry-typ
gages for determining the am
excess air passing through
and boilers. Three types are illu

---

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sor of 55 cubic feet per min-
ual delivery capacity for
low spots in track and other
rk on track or bridges and
s. Unit is mounted with en-
chassis fitted with either end
pneumatic-tired wheels, or
el wheels. Handle bars are
at front and rear. Low
has depressions for wheels
re clamping arrangement.

### Thermometer

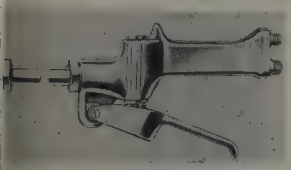
lco Instruments Co., 1929
alstead street, Chicago, has
he market a dial-indicating
eter scaled from 0 to 1000
Fahr. for dry kilns, solder
. Six-inch white dial face
k numerals. Instrument is
in mercury, gas-filled or
ctuations, and may be in-
t point of temperature tak-
t a distance.

### table Pulleys

American Pulley Co., 4200
on avenue, Philadelphia,
ed on the market an ad-
diameter wedgbelt pulley.
djusting collar of pulley is
ith a spanner wrench, side
aking up each groove are
l, increasing or decreasing
ameter for corresponding
anges. Unit may be applied
motor and driven shafts.
ive pulley is equivalent to
ozen or more individual
Range of adjustments be-
nimum and maximum pitch
is infinite. Side walls
up grooves move in or out
eously, thus producing belt
t which is maintained
belts ride high or low in

### ion Spray Gun

Mfg. Co., 3114 Carroll av-
cago, announces Thor Mod-
3 extension spray gun de-
allow operator to apply
ectly to surfaces that are
ut of reach of spray gun.



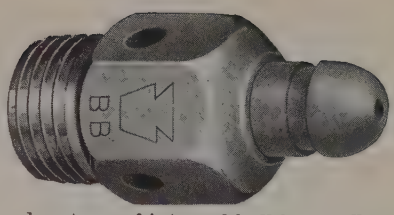
crew directly behind nozzle
trols width of spray. Unit
le in 3, 4, 5, 6 and 7-foot
anging in price from $40
mplete.

### neter

. S. Starrett Co., Athol,
ers its micrometer No. 436
against rust and stain and
wear-resistant spindle tips
and anvil for use where abrasive conditions exist. Sleeve and thimble on which are graduations and table of decimal equivalents are made of stainless steel. Units range in sizes from 0 to 24 inches and can be graduated to read in English or metric measure.

### Lubrication Fitting

■ Keystone Lubricating Co., 21st, Clearfield and Lippincott streets, Philadelphia, offers combination fitting with a ball head for direct contact with nozzles of standard push type or hydraulic high-pressure grease guns. Unit embodies all features of standard fitting with added



advantage of integral ball head. Reissue Patent No. 20743.

### Radial Coupling

■ Morse Chain Co., Ithaca, N. Y., has on the market Morflex radial couplings rated from 2 to 37 horsepower at 100 revolutions per minute and built with rubber bushings as

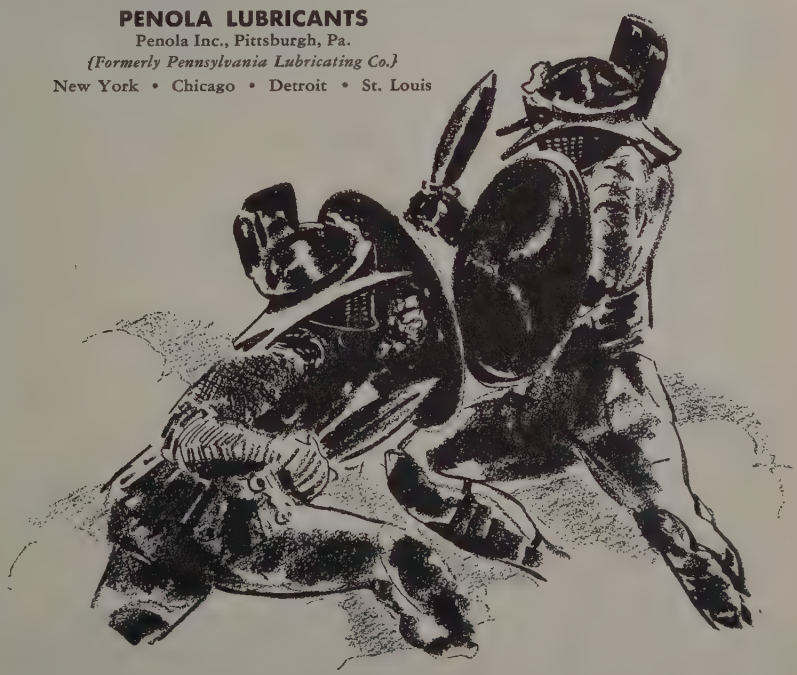

# To Prevent Contact Steel Picks PENOLA

ROLL neck bearings and reduction gears undergo a terrific beating daily... and, in 80% of all 4-high mills, they take it and come right back for more. Why? *Because those mills use Penola lubricants!*

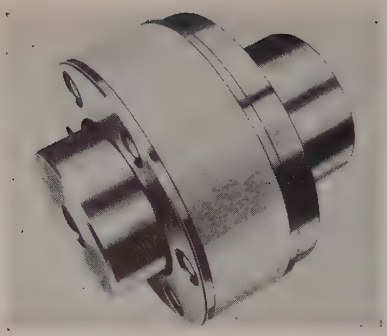
No matter how fine and costly steel mill machinery is, it cannot operate continuously under 5000-pounds-per-square-inch pressure *unless* it is protected from the metal-to-metal contact that ruins bearings and gear teeth.

Experienced steel men count on Penola for that protection! Which explains why Penola produces and sells more steel mill lubricants than any other maker in the world. Rely on Penola—and Penola *will see you through!*

**PENOLA LUBRICANTS**
Penola Inc., Pittsburgh, Pa.
*(Formerly Pennsylvania Lubricating Co.)*
New York • Chicago • Detroit • St. Louis



**LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1885**



sembled radially, equally spaced, on steel pins of yoke or hub member. Entire coupling is machined to insure balance, and having no metal on metal movement, is insulated against noise and electricity and requires no lubrication.

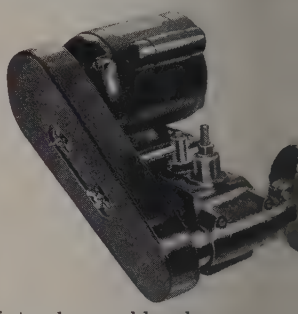
## Insulated Clevis

■ Ohio Brass Co., Mansfield, O., has developed insulated clevis-assemblies of hot-dip galvanized steel. The 2¼-inch spool insulator, held by a 4½-inch long clevis, is for dead-ending and corners on secondary circuits. Two other types, for primary circuits, have a spool insulator 4⅛ inches long. Spools are made of wet process porcelain, same as used in high-voltage insulators,

with a tapered hole to even
tribute mechanical load.

## Heavy Grinder

■ The Dumore Co., Racine, W
sin, has announced its No. 77
er for external or heavy i
grinding having a complete



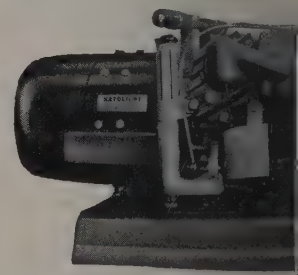
interchangeable sheaves or
allowing speeds from 3810
revolutions per minute suita
wheels of from 3 to 6 inches i
eter.

## Variable-Speed Unit

■ Briggs & Stratton Corp., M
kee, has announced the ma
ture and sale of the Grahan
now to be called Briggs & S
variable speed transmission.
range from ⅛ to 10 horsepow
have controls including manu
mote mechanical, remote ele
automatic, etc. Transmissio
speeds in infinite steps from
mum to zero and reverse, p
change in speed both runnin
stationary and develops full
over entire range of speed d
zero.

## Power Plant

■ Kato Engineering Co.,
kato, Minn., announces its
19A Quietlight 350 watts alter
current or 200 watts direct-
power plant. Light produ
flickerless with partial or fu
Unit carries 25 per cent o
continuously and has close
regulation. Plant comes wit
button starter, ammeter,
charge control. Plant is com



shielded and filtered, moun
sponge rubber mountings a
not have to be bolted dow
tank base holds one gallon,
for 10 hours of operation.

"Yes-BLAW-KNOX builds a complete line of buckets for STEEL PLANT SERVICE"
"This 2-line hook-on bucket, used where 2 hook blocks are available, is especially advantageous because:
It is a simple, rugged design having few parts—maintenance expense is low.
It is very easy for the crane operator to handle in picking up and discharging loads."
Blaw-Knox can meet your exacting requirements in bucket design. Send us your specification without obligation.
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BUCKETS
BLAW-KNOX DIVISION
OF BLAW-KNOX CO.
Farmers Bank Bldg. - Pittsburgh, Pa.

# Steelmaking Dips; Demand Irregular

## New Business Tends To Level Off; Shapes, Tin Plate Active

**MARKET IN TABLOID ★**

**Demand**
*Mixed but fairly steady in aggregate.*

**Prices**
*Steadier despite occasional concessions.*

**Production**
*Down 1 point to 52½ per cent.*

ED trends prevail in finished steel demand. in the aggregate are slight, but a tendency business to taper seasonally in some direc- a factor in arresting the recent upturn in in- luction.

naking last week was off 1 point to 52½ per mpared with 27 per cent a year ago. Only e fluctuations in output are in prospect the veral weeks, but the resumption of any ex- upturn will require greater support than cur- s being received from the automotive indus- is is expected the latter part of next quarter.

while, tin plate, structural shapes and con- inforcing bars continue relatively active and are offsetting the seasonal lag in demand e automotive and farm equipment industries. steel requirements for equipment building slow, but shipyards are well engaged. Ma- ol builders are experiencing brisk business, to xtent foreign, and government armament work lating demand for a few steel products.

continues a cloud in the automotive outlook settlement of recent strikes at Detroit and Steel releases for new model parts, while still re gaining gradually, but labor developments ay plans for the summer changeover in pro- from current models.

### Auto Production Loss From Strike

obile retail sales hold the comparative im- nt noted the past few weeks, and assemblies to be trimmed. Last week's total of 78,305 ghest in four weeks, was a gain of 13,000 but entirely from a sharp rise by Chrysler to ate for its recent shutdown during the Briggs General Motors increased from 30,640 units 0 in the face of the attempted UAW-AFL d Chrysler from 8145 to 22,900. Ford slipped ,600 to 15,500 and all others from 8820 to Total output was 87 per cent larger than a .

l large lots are included in fabricated shape orders and pending business. Awards include 3600 tons for a Rockefeller Center building, New York, and 2400 tons for a bridge, Delta, Calif. Inquiries are headed by 9243 tons for a New Jersey bridge.

Most railroads still defer major programs for equipment buying. Further improvement in carloadings and passage of legislation favorable to the carriers conceivably might stimulate car building in the second half, but steel producers are not counting on any marked revival in demand from this source soon.

### Tin Plate Tops Leading Products In Operations

Tin plate, most active of the major products, is continuing 70 per cent operations and apparently will do no better the next several weeks. Sustained shipments during July, with a seasonal tapering the latter half of next quarter, are indicated.

Some progress is being made toward more stable prices for steel, although quiet in new business provides sheet and strip quotations little test. Occasional shading on some other products usually is confined to a few districts. Backlogs of flat-rolled steel gradually are being reduced, with a more rapid movement seen for July and August.

Last week's dip in steelmaking resulted largely from lower schedules at Pittsburgh and Chicago. The former was down 3 points to 40 per cent. Chicago mills, feeling effects of slower business from farm equipment plants, also dropped 3 points to 49½ per cent. Youngstown advanced 1 point to 52 per cent. Cleveland was up 2½ points to 55½, Birmingham rose 4 points to 71 and Cincinnati increased 5 points to 73.

Steady schedules continued at other centers, including 37 per cent in eastern Pennsylvania, 73 per cent at Wheeling, 44 at Buffalo, 40 in New England and 57 at Detroit.

Scrap prices generally are firm despite a leveling off after a steady rise the past few weeks. The composite holds at $14.62. Composite of finished steel prices is unchanged at $55.70.

# COMPOSITE MARKET AVERAGES

| | June 17 | June 10 | June 3 | One Month Ago May, 1939 | Three Months Ago March, 1939 | One Year Ago June, 1938 | F Yea Jun |
|---|---|---|---|---|---|---|---|
| Iron and steel .... | $35.71 | $35.72 | $35.59 | $35.80 | $36.40 | $38.41 | $3 |
| Finished Steel .... | 55.70 | 55.70 | 55.70 | 56.00 | 56.50 | 61.55 | 5 |
| Steelworks Scrap.. | 14.62 | 14.62 | 14.00 | 14.05 | 14.98 | 10.89 | 1 |

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

# COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Yea

## Finished Material

| | June 17, 1939 | May 1939 | March 1939 | June 1938 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.15c | 2.20c | 2.25c | 2.45c |
| Steel bars, Chicago | 2.15 | 2.20 | 2.25 | 2.40 |
| Steel bars, Philadelphia | 2.47 | 2.52 | 2.57 | 2.47 |
| Iron bars, Terre Haute, Ind. | 2.05 | 2.10 | 2.15 | 2.35 |
| Shapes, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.25 |
| Shapes, Philadelphia | 2.215 | 2.21½ | 2.21½ | 2.40¼ |
| Shapes, Chicago | 2.10 | 2.10 | 2.10 | 2.25 |
| Plates, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.25 |
| Plates, Philadelphia | 2.15 | 2.15 | 2.15 | 2.371 |
| Plates, Chicago | 2.10 | 2.10 | 2.10 | 2.25 |
| Sheets, hot-rolled, Pittsburgh | 2.00 | 2.05 | 2.15 | 2.40 |
| Sheets, cold-rolled, Pittsburgh | 3.05 | 3.10 | 3.20 | 3.45 |
| Sheets, No. 24 galv., Pittsburgh | 3.50 | 3.50 | 3.50 | 3.75 |
| Sheets, hot-rolled, Gary | 2.00 | 2.03 | 2.15 | 2.40 |
| Sheets, cold-rolled, Gary | 3.05 | 3.08 | 3.20 | 3.20 |
| Sheets, No. 24 galv., Gary | 3.50 | 3.50 | 3.50 | 3.80 |
| Bright bess., basic wire, Pitts. | 2.60 | 2.60 | 2.60 | 2.90 |
| Tin plate, per base box, Pitts. | $5.00 | $5.00 | $5.00 | $5.35 |
| Wire nails, Pittsburgh | 2.45 | 2.45 | 2.45 | 2.75 |

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, Pittsburgh, Chicago | $34.00 | $34.00 | $34.00 | $37.00 |
| Slabs, Pittsburgh, Chicago | 34.00 | 34.00 | 34.00 | 37.00 |
| Rerolling billets, Pittsburgh | 34.00 | 34.00 | 34.00 | 37.00 |
| Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts. | 43.00 | 43.00 | 43.00 | 47.00 |

## Pig Iron

| | June 17, 1939 | May 1939 | March 1939 |
|---|---|---|---|
| Bessemer, del. Pittsburgh | $22.34 | $22.34 | $22 34 |
| Basic, Valley | 20.50 | 20.50 | 20.50 |
| Basic, eastern, del. Philadelphia | 22.34 | 22.34 | 22.34 |
| No. 2 foundry, Pittsburgh | 22.21 | 22.21 | 22.21 |
| No. 2 foundry, Chicago | 21.00 | 21.00 | 21.00 |
| Southern No. 2, Birmingham | 17.38 | 17.38 | 17.38 |
| Southern No. 2, del. Cincinnati | 20.89 | 20.89 | 20.89 |
| No. 2X, del. Phila. (differ. av.) | 23.215 | 23.215 | 23.215 |
| Malleable, Valley | 21.00 | 21.00 | 21.00 |
| Malleable, Chicago | 21.00 | 21.00 | 21.00 |
| Lake Sup., charcoal, del. Chicago | 28.34 | 28.34 | 28.34 |
| Gray forge, del. Pittsburgh | 21.17 | 21.17 | 21.17 |
| Ferromanganese, del. Pittsburgh | 85.33 | 85.33 | 85.27 |

## Scrap

| | | | |
|---|---|---|---|
| Heavy melting steel, Pittsburgh | $15.25 | $14.55 | $15.75 |
| Heavy melt. steel, No. 2, E. Pa. | 13.25 | 12.75 | 13.40 |
| Heavy melting steel, Chicago | 13.50 | 12.75 | 14.25 |
| Rails for rolling, Chicago | 17.75 | 17.25 | 17.25 |
| Railroad steel specialties, Chicago | 15.50 | 14.75 | 16.25 |

## Coke

| | | | |
|---|---|---|---|
| Connellsville, furnace, ovens | $3.75 | $3.75 | $3.75 |
| Connellsville, foundry, ovens | 5.00 | 5.00 | 5.00 |
| Chicago, by-product fdry., del. | 10.50 | 10.50 | 10.50 |

# STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

*Except when otherwise designated, prices are base, f.o.b. cars.*

## Sheet Steel

**Hot Rolled**

| | |
|---|---|
| Pittsburgh | 2.00c |
| Chicago, Gary | 2.00c |
| Cleveland | 2.00c |
| Detroit, del. | 2.00c |
| Buffalo | 2.00c |
| Sparrows Point, Md. | 2.00c |
| New York, del. | 2.24c |
| Philadelphia, del. | 2.17c |
| Granite City, Ill. | 2.10c |
| Middletown, O. | 2.00c |
| Youngstown, O. | 2.00c |
| Birmingham | 2.00c |
| Pacific Coast points | 2.50c |

**Cold Rolled**

| | |
|---|---|
| Pittsburgh | 3.05c |
| Chicago, Gary | 3.05c |
| Buffalo | 3.05c |
| Cleveland | 3.05c |
| Detroit, delivered | 3.15c |
| Philadelphia, del. | 3.37c |
| New York, del. | 3.39c |
| Granite City, Ill. | 3.15c |
| Middletown, O. | 3.05c |
| Youngstown, O. | 3.05c |
| Pacific Coast points | 3.65c |

**Galvanized No. 24**

| | |
|---|---|
| Pittsburgh | 3.50c |
| Chicago, Gary | 3.50c |
| Buffalo | 3.50c |
| Sparrows Point, Md. | 3.50c |
| Philadelphia, del. | 3.67c |
| New York, delivered | 3.74c |
| Birmingham | 3.50c |
| Granite City, Ill. | 3.60c |
| Middletown, O. | 3.50c |
| Youngstown, O. | 3.50c |
| Pacific Coast points | 4.00c |

**Black Plate, No. 29 and Lighter**

| | |
|---|---|
| Pittsburgh | 3.05c |
| Chicago, Gary | 3.05c |
| Granite City, Ill. | 3.15c |

**Long Ternes No. 24 Unassorted**

| | |
|---|---|
| Pittsburgh, Gary | 3.80c |
| Pacific Coast | 4.50c |

**Enameling Sheets**

| | No. 10 | No. 20 |
|---|---|---|
| Pittsburgh | 2.75c | 3.35c |
| Chicago, Gary | 2.75c | 3.35c |
| Granite City, Ill. | 2.85c | 3.45c |
| Youngstown, O. | 2.75c | 3.35c |
| Cleveland | 2.75c | 3.35c |
| Middletown, O. | 2.75c | 3.35c |
| Pacific Coast | 3.35c | 3.95c |

## Corrosion and Heat-Resistant Alloys

*Pittsburgh base, cents per lb.*

**Chrome-Nickel**

| | No. 302 | No. 304 |
|---|---|---|
| Bars | 24.00 | 25.00 |
| Plates | 27.00 | 29.00 |
| Sheets | 34.00 | 36.00 |
| Hot strip | 21.50 | 23.50 |
| Cold strip | 28.00 | 30.00 |

**Straight Chromes**

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| Bars | 18.50 | 19.00 | 22.50 | 27.50 |
| Plates | 21.50 | 22.00 | 25.50 | 30.50 |
| Sheets | 26.50 | 29.00 | 32.50 | 36.50 |
| Hot strip | 17.00 | 17.50 | 24.00 | 35.00 |
| Cold stp. | 22.00 | 22.50 | 32.00 | 52.00 |

## Steel Plate

| | |
|---|---|
| Pittsburgh | 2.10c |
| New York, del. | 2.19-2.29c |
| Philadelphia, del. | 2.15c |
| Boston, delivered | 2.42c |
| Buffalo, delivered | 2.33c |
| Chicago or Gary | 2.10c |
| Cleveland | 2.10c |
| Birmingham | 2.10c |
| Coatesville, base | 2.10c |
| Sparrows Point, base | 2.10c |
| Claymont, del. | 2.10c |
| Youngstown | 2.10c |
| Gulf ports | 2.45c |
| Pacific Coast points | 2.60c |

**Steel Floor Plates**

| | |
|---|---|
| Chicago | 3.35c |
| Gulf ports | 3.70c |
| Pacific Coast ports | 3.95c |
| Pittsburgh | 3.35c |

## Standard Shapes

| | |
|---|---|
| Pittsburgh | 2.10c |
| Philadelphia, del. | 2.21½c |
| New York, del. | 2.27c |
| Boston, delivered | 2.41c |
| Bethlehem | 2.10c |
| Chicago | 2.10c |
| Cleveland, del. | 2.30c |
| Buffalo | |
| Gulf ports | |
| Birmingham | |
| St. Louis, del. | |
| Pacific Coast points | |

## Tin and Terne P

**Tin Plate, Coke (base**

| | |
|---|---|
| Pittsburgh, Gary, Chicag | |
| Granite City, Ill. | |

**Mfg. Terne Plate (bas**

| | |
|---|---|
| Pittsburgh, Gary, Chica | |
| Granite City, Ill. | |

## Bars

**Soft Steel**

*(Base, 3 tons or ov*

| | |
|---|---|
| Pittsburgh | |
| Chicago or Gary | |
| Duluth | |
| Birmingham | |
| Cleveland | |
| Buffalo | |
| Detroit, delivered | |
| Philadelphia, del. | |
| Boston, delivered | |
| New York, del. | |
| Gulf ports | |
| Pacific Coast points | |

**Rail Steel**

*(Base, 15 to 50 ton*

| | |
|---|---|
| Pittsburgh | |
| Chicago or Gary | |
| Detroit, delivered | |
| Cleveland | |

| | |
|---|---|
| ..... | 2.00c |
| ım ..... | 2.00c |
| s ..... | 2.35c |
| ast points.... | 2.60c |

**Iron**

| | |
|---|---|
| Terre Haute... | 2.05c |
| ia ..... | 2.37c |
| , refined.... | 3.50-8.00c |

**Reinforcing**

*st, straight lengths, d by distributors*

| | |
|---|---|
| Gary, Buffalo | |
| Birm., Young., | |
| s Pt., Pitts.. | 1.80-2.05c |
| elivered .... | 1.90-2.15c |
| ..... | 2.20-2.40c |
| ast ports..... | 2.50c |
| ia, del. .... | 1.97-2.22c |

*el, straight lengths, d by distributors*

| | |
|---|---|
| , Gary, Chi- | |
| Buffalo, Cleve- | |
| irm..... | 1.75-1.90c |
| elivered..... | 1.85-2.00c |
| ..... | 2.10-2.25c |
| ast ..... | 2.35c |

## roducts

*e.-Chicago-Birm. base lb. keg in carloads*

| | |
|---|---|
| wire nails .... | $2.45 |
| ated nails .... | $2.45 |
| (Per pound) | |
| taples ..... | 3.15c |
| e staples ..... | 3.40c |
| ed wire, stand- | |
| ¼ gage two- | |
| g, 80-rod spool | |
| wo-point cattle, | |
| spool..... | $2.62 |
| fence wire.... | 2.95c |
| e wire..... | 3.35c |
| re fencing (base | |
| olumn) ..... | 67.00 |
| op bale ties, | |
| L. column)... | 56.00 |

**nufacturing Trade**

*e. - Cleve. - Chicago-ham (except spring wire)*

| | |
|---|---|
| s., basic wire.. | 2.60c |
| d wire ..... | 2.65c |
| re ..... | 3.20c |

, Mass., $2 higher on basic and spring wire.

## ails

Pittsburgh.....$3.60

## inished Bars

| | Carbon | Alloy |
|---|---|---|
| n .... | 2.65c | 3.35c |
| ..... | 2.65c | 3.35c |
| .... | 2.65c | 3.35c |
| ..... | 2.70c | *3.45c |
| ..... | 2.65c | 3.35c |
| ..... | 2.65c | 3.35c |

red.

## Bars (Hot)

*, 3 tons or over)*

| | |
|---|---|
| , Buffalo, Chi- | |
| Massillon, Can- | |
| thlehem ..... | 2.70c |
| elivered ..... | 2.80c |

| Alloy | | Alloy |
|---|---|---|
| Diff. | S.A.E. | Diff. |
| 0.35 | 3100..... | 0.70 |
| 0.75 | 3200..... | 1.35 |
| 1.55 | 3300..... | 3.80 |
| 2.25 | 3400..... | 3.20 |

| | |
|---|---|
| to 0.25 Mo..... | 0.55 |
| to 0.30 Mo. 1.50- | |
| ..... | 1.10 |
| 1.10 Cr. ..... | 0.45 |
| pring flats ..... | 0.15 |
| ..... | 1.20 |
| g flats ..... | 0.85 |
| n. ..... | 1.50 |
| an. ..... | 0.85 |
| g flats ..... | 0.15 |
| g rounds, squares | 0.40 |

furnace up 50 cents.

## Strip and Hoops

*(Base, hot-rolled, 1 to 20 tons; cold-rolled, 3 to 25 tons)*

**Hot Strip, 12-inch and less**

| | |
|---|---|
| Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham.... | 2.00c |
| Detroit, del. ..... | 2.10c |
| Philadelphia, del. .... | 2.32c |
| New York, del. ..... | 2.36c |
| Cooperage hoop, Youngs., Pitts.; Chicago, Birm. | 2.10c |
| Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown | 2.80c |
| Chicago ..... | 2.90c |
| Detroit, del. ..... | 2.90c |
| Worcester, Mass. ..... | 3.00c |

| Carbon | Cleve., | Pitts. |
|---|---|---|
| 0.26—0.50..... | | 2.80c |
| 0.51—0.75..... | | 4.30c |
| 0.76—1.00..... | | 6.15c |
| Over 1.00..... | | 8.35c |

Worcester, Mass $4 higher.

**Commodity Cold-Rolled Strip**

| | |
|---|---|
| Pitts.-Cleve.-Youngstown | 2.95c |
| Detroit, del. ..... | 3.05c |
| Worcester, Mass. ..... | 3.35c |

Lamp stock up 10 cents.

## Rails, Fastenings

*(Gross Tons)*

| | |
|---|---|
| Standard rails, mill..... | $40.00 |
| Relay rails, Pittsburgh 20—100 lbs. .....32.50-35.50 | |
| Light rails, billet qual., Pitts., Chicago, B'ham. | $40.00 |
| Do., rerolling quality.. | 39.00 |

*Cents per pound*

| | |
|---|---|
| Angle bars, billet, mills. | 2.70c |
| Do., axle steel ..... | 2.35c |
| Spikes, R. R. base ..... | 3.00c |
| Track bolts, base ..... | 4.15c |
| Car axles forged, Pitts., Chicago, Birmingham. | 3.15c |
| Tie plates, base ..... | 2.15c |

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

## Bolts and Nuts

*Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.*

**Carriage and Machine**

| | |
|---|---|
| ½ x 6 and smaller.....68.5 off | |
| Do. larger, to 1-in.....66 off | |
| Do. 1⅛ and larger.....64 off | |
| Tire bolts .....52.5 off | |

**Stove Bolts**

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

| | |
|---|---|
| Step bolts .....60 off | |
| Elevator bolts .....60 off | |
| Plow bolts .....68.5 off | |

**Nuts**

| Semifinished hex. | U.S.S. | S.A.E. |
|---|---|---|
| 6-inch and less.. | 67 | 70 |
| ⅞—1-inch ..... | 64 | 65 |
| 1⅛ and larger.. | 62 | 62 |

**Hexagon Cap Screws**

Upset, 1-in., smaller.....67.5 off

**Square Head Set Screws**

| | |
|---|---|
| Upset, 1-in., smaller.....75.0 off | |
| Headless set screws.....70.0 off | |

## Piling

| | |
|---|---|
| Pitts., Chgo., Buffalo.... | 2.40c |
| Gulf ports ..... | 2.75c |

## Rivets, Washers

| | |
|---|---|
| Structural, Pittsburgh, Cleveland, Chicago ... | 3.40c |
| ⅞-inch and smaller, 11 and 12 ..... 63½ | 54 |
| Pitts., Chi., Cleve.....65-10 off | |
| Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off | |

## Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

**Butt Weld**

Steel

| In. | Blk. | Galv. |
|---|---|---|
| ½ ..... | 63½ | 54 |
| ¾ ..... | 66½ | 58 |
| 1—3 ..... | 68½ | 60½ |

Iron

| | | |
|---|---|---|
| ¾ ..... | 30 | 13 |
| 1—1¼ ..... | 34 | 19 |
| 1½ ..... | 38 | 21½ |
| 2 ..... | 37½ | 21 |

**Lap Weld**

Steel

| | | |
|---|---|---|
| 2 ..... | 61 | 52½ |
| 2½—3 ..... | 64 | 55½ |
| 3½—6 ..... | 66 | 57½ |
| 7 and 8 ..... | 65 | 55½ |
| 9 and 10 ..... | 64½ | 55 |

Iron

| | | |
|---|---|---|
| 2 ..... | 30½ | 15 |
| 2½—3½ ..... | 31½ | 17½ |
| 4 ..... | 33½ | 21 |
| 4½—8 ..... | 32½ | 20 |
| 9—12 ..... | 28½ | 15 |

**Line Pipe**

Steel

| | |
|---|---|
| 1 to 3, butt weld ..... | 67½ |
| 2, lap weld ..... | 60 |
| 2½ to 3, lap weld ..... | 63 |
| 3½ to 6, lap weld ..... | 65 |
| 7 and 8, lap weld ..... | 64 |
| 10-inch lap weld ..... | 63½ |
| 12-inch, lap weld ..... | 62½ |

Iron

| | Blk. | Galv. |
|---|---|---|
| ¾ butt weld ..... | 25 | 7 |
| 1 and 1¼ butt weld | 29 | 13 |
| 1½ butt weld .... | 33 | 15½ |
| 2 butt weld ..... | 32½ | 15 |
| 1½ lap weld ..... | 23½ | 7 |
| 2 lap weld ..... | 25½ | 9 |
| 2½ to 3½ lap weld | 26½ | 11½ |
| 4 lap weld ..... | 28½ | 15 |
| 4½ to 8 lap weld.. | 27½ | 14 |
| 9 to 12 lap weld... | 23½ | 9 |

## Boiler Tubes

*Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.*

**Lap Welded**

| Sizes | Gage | Steel | Charcoal Iron |
|---|---|---|---|
| 1½" O. D. | 13 | $ 9.72 | $23.71 |
| 1¾" O. D. | 13 | 11.06 | 22.93 |
| 2" O. D. | 13 | 12.38 | 19.35 |
| 2¼" O. D. | 13 | 13.79 | 21.68 |
| 2¼" O. D. | 12 | 15.16 | ..... |
| 2½" O. D. | 12 | 16.58 | 26.57 |
| 2¾" O. D. | 12 | 17.54 | 29.00 |
| 3" O. D. | 12 | 18.35 | 31.36 |
| 3½" O. D. | 11 | 23.15 | 39.81 |
| 4" O. D. | 10 | 28.66 | 49.90 |
| 5" O. D. | 9 | 44.25 | 73.93 |
| 6" O. D. | 7 | 68.14 | ..... |

**Seamless**

| Sizes | Gage | Hot Rolled | Cold Drawn |
|---|---|---|---|
| 1" O. D. | 13 | $ 7.82 | $ 9.01 |
| 1¼" O. D. | 13 | 9.26 | 10.67 |
| 1½" O. D. | 13 | 10.23 | 11.79 |
| 1¾" O. D. | 13 | 11.64 | 13.42 |
| 2" O. D. | 13 | 13.04 | 15.03 |
| 2¼" O. D. | 13 | 14.54 | 16.76 |
| 2¼" O. D. | 12 | 16.01 | 18.45 |
| 2½" O. D. | 12 | 17.54 | 20.21 |
| 2¾" O. D. | 12 | 18.59 | 21.42 |
| 3" O. D. | 12 | 19.50 | 22.48 |
| 3½" O. D. | 11 | 24.62 | 28.37 |
| 4" O. D. | 10 | 30.54 | 35.20 |
| 4½" O. D. | 10 | 37.35 | 43.04 |
| 5" O. D. | 9 | 46.87 | 54.01 |
| 6" O. D. | 7 | 71.96 | 82.93 |

## Cast Iron Pipe

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in., & over, Birm.. | $42.00-43.00 |
| 4-in., Birmingham.. | 45.00-46.00 |
| 4-in., Chicago..... | 53.80-54.80 |
| 6-in. & over, Chicago | 50.80-51.80 |
| 6-in. & over, east fdy. | 46.00 |
| Do., 4-in. ..... | 49.00 |

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

## Semifinished Steel

**Rerolling Billets, Slabs**

*(Gross Tons)*

| | |
|---|---|
| Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point.. | $34.00 |
| Duluth (billets) ..... | 36.00 |
| Detroit, delivered ..... | 36.00 |

**Forging Quality Billets**

| | |
|---|---|
| Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.. | 40.00 |
| Duluth ..... | 42.00 |

**Sheet Bars**

| | |
|---|---|
| Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago.. | 34.00 |
| Detroit, delivered ..... | 36.00 |

**Wire Rods**

| | |
|---|---|
| Pitts., Cleveland, Chicago, Birmingham No. 5 to $\frac{9}{32}$-inch incl. ..... | 43.00 |
| Do., over $\frac{9}{32}$ to $\frac{47}{64}$-in. incl. | 48.00 |

Worcester up $2; Galveston up $6; Pacific Coast up $9.

**Skelp**

| | |
|---|---|
| Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt. | 1.90c |

## Coke

*Price Per Net Ton*

**Beehive Ovens**

| | |
|---|---|
| Connellsville, fur... | $3.75 |
| Connellsville, fdry.. | 4.75- 5.50 |
| Connell. prem. fdry. | 5.75- 6.25 |
| New River fdry.... | 6.50- 6.75 |
| Wise county fdry... | 5.50- 5.75 |
| Wise county fur.... | 4.50- 4.75 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del... | 10.88-11.35 |
| Chi., ov., outside del. | 9.75 |
| Chicago, del. ..... | 10.50 |
| Terre Haute, del. .. | 10.00 |
| Milwaukee, ovens.. | 10.50 |
| New England, del... | 12.50 |
| St. Louis, del. ..... | 11.00-11.50 |
| Birmingham, ovens. | 7.00 |
| Indianapolis, del.... | 10.00 |
| Cincinnati, del..... | 9.75 |
| Cleveland, del..... | 10.30 |
| Buffalo, del. ..... | 10.50 |
| Detroit, del. ..... | 10.25 |
| Philadelphia, del... | 10.65 |

## Coke By-Products

*Spot, gal., freight allowed east of Omaha*

| | |
|---|---|
| Pure and 90% benzol... | 16.00c |
| Toluol, two degree..... | 22.00c |
| Solvent naphtha ..... | 26.00c |
| Industrial xylol ..... | 26.00c |

*Per lb. f.o.b. Frankford and St. Louis*

| | |
|---|---|
| Phenol (200 lb. drums) | 16.25c |
| Do. (450 lbs.) ..... | 15.25c |

Eastern Plants, per lb.

| | |
|---|---|
| Naphthalene flakes, balls, bbls. to jobbers ..... | 5.75c |
| Per ton, bulk, f.o.b. port | |
| Sulphate of ammonia....$28.00 | |

## Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

| Basing Points: | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Bethlehem, Pa. | $22.00 | $22.50 | $21.50 | $23.00 |
| Birdsboro, Pa. | 22.00 | 22.50 | 21.50 | 23.00 |
| Birmingham, Ala.‡ | 17.38 | ..... | 16.38 | 22.00 |
| Buffalo | 21.00 | 21.50 | 20.00 | 22.00 |
| Chicago | 21.00 | 21.00 | 20.50 | 21.50 |
| Cleveland | 21.00 | 21.00 | 20.50 | 21.50 |
| Detroit | 21.00 | 21.00 | 20.50 | 21.50 |
| Duluth | 21.50 | 21.50 | ..... | 22.00 |
| Erie, Pa. | 21.00 | 21.50 | 20.50 | 22.00 |
| Everett, Mass. | 22.00 | 22.50 | 21.50 | 23.00 |
| Granite City, Ill. | 21.00 | 21.00 | 20.50 | 21.50 |
| Hamilton, O. | 21.00 | 21.00 | 20.50 | ..... |
| Neville Island, Pa. | 21.00 | 21.00 | 20.50 | 21.50 |
| Provo, Utah | 19.00 | ..... | ..... | ..... |
| Sharpsville, Pa. | 21.00 | 21.00 | 20.50 | 21.50 |
| Sparrow's Point, Md. | 22.00 | ..... | 21.50 | ..... |
| Swedeland, Pa. | 22.00 | 22.50 | 21.50 | 23.00 |
| Toledo, O. | 21.00 | 21.00 | 20.50 | 21.50 |
| Youngstown, O. | 21.00 | 21.00 | 20.50 | 21.50 |

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

| Delivered from Basing Points: | | | | |
|---|---|---|---|---|
| Akron, O., from Cleveland | 22.39 | 22.39 | 21.89 | 22.89 |
| Baltimore from Birmingham | 22.78 | ..... | 21.66 | ..... |
| Boston from Birmingham | 22.12 | ..... | ..... | ..... |
| Boston from Everett, Mass. | 22.50 | 23.00 | 22.00 | 23.50 |
| Boston from Buffalo | 22.50 | 23.00 | 22.00 | 23.50 |
| Brooklyn, N. Y., from Bethlehem | 24.50 | 25.00 | ..... | ..... |
| Canton, O., from Cleveland | 22.39 | 22.39 | 21.89 | 22.89 |
| Chicago from Birminghom | †21.22 | ..... | ..... | ..... |
| Cincinnati from Hamilton, O. | 21.24 | 22.11 | 21.61 | ..... |
| Cincinnati from Birmingham | 21.06 | ..... | 20.06 | ..... |
| Cleveland from Birmingham | 21.32 | ..... | 20.82 | ..... |
| Mansfield, O., from Toledo, O. | 22.94 | 22.94 | 22.44 | 22.44 |
| Milwaukee from Chicago | 22.10 | 22.10 | 21.60 | 22.60 |
| Muskegon, Mich., from Chicago, Toledo or Detroit | 24.19 | 24.19 | 23.69 | 24.69 |
| Newark, N. J., from Birmingham | 23.15 | ..... | ..... | ..... |
| Newark, N. J., from Bethlehem | 23.53 | 24.03 | ..... | ..... |
| Philadelphia from Birmingham | 22.46 | ..... | 21.96 | ..... |
| Philadelphia from Swedeland, Pa. | 22.84 | 23.34 | 22.34 | ..... |
| Pittsburgh district from Neville Island | Neville base, plus 69c, 84c, and $1.24 freight. | | | |
| Saginaw, Mich., from Detroit | 23.45 | 23.45 | 22.95 | 22.95 |

| | No. 2 Fdry. | Malleable | Basic |
|---|---|---|---|
| St. Louis, northern | 21.50 | 21.50 | 21.00 |
| St. Louis from Birmingham | †21.12 | ..... | 20.62 |
| St. Paul from Duluth | 23.63 | 23.63 | ..... |

†Over 0.70 phos.

**Low Phos.**

Basing Points: Birdsboro and Steelton, Pa., and Standish $26.50, base; $27.74 delivered Philadelphia.

| Gray Forge | | Charcoal | |
|---|---|---|---|
| Valley furnace | $20.50 | Lake Superior fur. | |
| Pitts. dist. fur. | 20.50 | do., del Chicago | |
| | | Lyles, Tenn. | |

**†Silvery**

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—9-9.50—$28.50; Buffalo, $1.25 higher.

**Bessemer Ferrosilicon†**

Jackson county, O., base; Prices are the same as for s plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 $1 per ton add. Each unit over 3%, add $1 per ton.

## Refractories

*Per 1000 f.o.b. Works, Net Prices*

**Fire Clay Brick**

*Super Quality*

| | |
|---|---|
| Pa., Mo., Ky. | $60.80 |

*First Quality*

| | |
|---|---|
| Pa., Ill., Md., Mo., Ky. | 47.50 |
| Alabama, Georgia | 47.50 |
| New Jersey | 52.50 |

*Second Quality*

| | |
|---|---|
| Pa., Ill., Ky., Md., Mo. | 42.75 |
| Georgia, Alabama | 34.20 |
| New Jersey | 49.00 |

*Ohio*

| | |
|---|---|
| First quality | 39.90 |
| Intermediate | 36.10 |
| Second quality | 31.35 |

**Malleable Bung Brick**

| | |
|---|---|
| All bases | $56.05 |

**Silica Brick**

| | |
|---|---|
| Pennsylvania | $47.50 |
| Joliet, E. Chicago | 55.10 |
| Birmingham, Ala. | 47.50 |

**Ladle Brick**

*(Pa., O., W. Va., Mo.)*

| | |
|---|---|
| Dry press | $28.00 |
| Wire cut | $26.00 |

**Magnesite**

Imported dead - burne grains, net ton f.o.b Chester, Pa., and Bal timore bases (bags)

Do. domestic

Do., f.o.b. Chewelah Wash., net ton, bulk. net ton, bags

Quickset magnesit grains, f.o.b. Chewe lah, Wash., net, bul

**Basic Brick**

*Net ton, f.o.b. Baltimo mouth Meeting, Chest*

Chrome brick

Chem. bonded chrome

Magnesite brick

Chem. bonded magnesit

## Fluorspar, 85-5

Washed gravel, duty pd., tide, net ton $21

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail 17

Do, barge 18

No. 2 lump 18

## Ferroalloy Prices

**Ferromanganese,** 78-82%, tidewater, duty pd. $80.00

Do., del. Pittsburgh 85.33

**Spiegeleisen,** 19-21% dom. Palmerton, Pa., spot 28.00

Do., 26-28%, Palmerton 33.00

**Ferrosilicon,** 50% freight allowed, c.l. 69.50

Do., ton lot 80.50

Do., 75 per cent 126.00

Spot, $5 a ton higher.

**Silicoman,** 2½ carbon 88.00

2% carbon, 93.00; 1%, 103.00

Contract ton price $11 higher; spot $5 over contract.

**Ferrotungsten,** stand., lb. con. del. cars 1.60-1.65

**Ferrovanadium,** 35 to 40%, lb., cont. 2.70-2.80-2.90

**Ferrophosphorus,** gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

**Ferrochrome,** 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c

Do., ton lots 11.25c

Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained

| | |
|---|---|
| chrome | 16.50c |
| Do., ton lots | 17.25c |
| Do., less-ton lots | 17.75c |

| | Carloads | Ton lots | Less ton |
|---|---|---|---|
| 2% carb. | 16.50c | 17.25c | 17.50c |
| 1% carb. | 17.50c | 18.25c | 18.50c |
| 0.10% carb. | 18.50c | 19.25c | 19.50c |
| 0.20% carb. | 19.50c | 20.25c | 20.50c |

Spot ¼c higher

**Ferromolybdenum,** 55-65% molyb. cont., f.o.b. mill, lb. 0.95

**Calcium molybdate,** lb. molyb. cont., f.o.b. mill 0.80

**Ferrotitanium,** 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23

Do., less-ton lots 1.25

20-25% carbon, 0.10 max., ton lots, lb. 1.35

Do, less-ton lots 1.40

Spot 5c higher

**Ferrocolumbium,** 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25

Do, less-ton lots 2.30

Spot is 10c higher

**Technical molybdenum trioxide,** 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

**Ferro-carbon-titanium,** 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50

Do, spot 145.00

Do, contract, ton lots 145.00

Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50

Do, spot 160.00

Do, contract, ton lots 160.00

Do, spot, ton lots 165.00

**Alsifer,** contract carlots, f.o.b. Niagara Falls, lb. 7.50c

Do, ton lots 8.00c

Do, less-ton lots 8.50c

Spot ½c lb. higher

**Chromium Briquets,** contract, any quantity, freight allowed, lb. 7.25c

Do, spot carlots, bulk 7.50c

Do, ton lots 8.00c

Do., less-ton lots 8.25c

**Tungsten Metal Powder,** according to grade, spot shipment, 200-lb. drum lots, lb. $2.00

Do, smaller lots 2.10

**Vanadium Pentoxide,** contract, lb. contained $1.10

Do, spot 1.15

**Chromium Metal,** 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c

Do, spot 85.00c

88% chrome, contract 79.00c

Do, spot 84.00c

**Silicon Metal,** 1% iron, contract, carlots, 2 ⅛-in., lb.

Do, 2%

Spot ¼c highe

**Silicon Briquets,** contrac carloads freight a lowed, ton

Carload, spot

Less-ton lots, lb.

**Manganese Briquet** contract carload bulk freight allowe lb.

Ton lots

Less-ton lots

Spot ¼c highe

**Zirconium Alloy,** 12-15% contract, carload gross ton

Do, spot

34-40%, contract, ca loads, lb., alloy

Do, ton lots

Do, less-ton lots

Spot ¼c highe

**Molybdenum Powde** 99%, f.o.b. York, P 200-lb. kegs, lb.

Do, 100-200 lb. lots

Do, under 100-lb. lo

**Molybdenum Oxi Briquets,** 48-52% m lybdenum, per pou contained, f.o.b. pr ducers' plant

# WAREHOUSE STEEL PRICES

*Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials*

| | Soft Bars | Bands | Hoops | Plates ¼-in. & Over | Structural Shapes | Floor Plates | Sheets: Hot Rolled | Sheets: Cold Rolled | Sheets: Galv. No. 24 |
|---|---|---|---|---|---|---|---|---|---|
| ..... | 3.88 | 4.06 | 5.06 | 3.85 | 3.85 | 5.66 | 3.71 | 4.78 | 4.61 |
| k (Metropolitan)... | 3.84 | 3.96 | 3.96 | 3.76 | 3.75 | 5.56 | 3.40 | 4.60 | 4.50 |
| hia ..... | 3.60 | 3.60 | 4.10 | 3.40 | 3.40 | 5.00 | 3.40 | .... | 4.43 |
| ..... | 3.70 | 3.80 | 4.80 | 3.55 | 3.55 | 5.00 | 3.55 | 4.90 | 4.30 |
| Va. ..... | 3.90 | 4.00 | .... | 3.75 | 3.75 | 5.20 | 3.75 | .... | 5.40 |
| ..... | 3.35 | 3.82 | 3.82 | 3.62 | 3.40 | 5.25 | 3.35 | 4.40 | 4.40 |
| h ..... | 3.35 | 3.60 | 3.60 | 3.40 | 3.40 | 5.00 | 3.35 | 4.45 | 4.50 |
| ..... | 3.25 | 3.50 | 3.50 | 3.40 | 3.58 | 5.18 | 3.35 | 4.55 | 4.62 |
| ..... | 3.33 | 3.43 | 3.68 | 3.60 | 3.65 | 5.27 | 3.43 | 4.50 | 4.59 |
| l ..... | 3.60 | 3.67 | 3.67 | 3.65 | 3.68 | 5.28 | 3.42 | .... | 4.57 |
| ..... | 3.50 | 3.75 | 3.75 | 3.55 | 3.55 | 5.15 | 3.35 | 4.30 | 4.25 |
| lis-St. Paul ..... | 3.75 | 3.85 | 3.85 | 3.80 | 3.80 | 5.40 | 3.60 | 4.95 | 4.50 |
| e ..... | 3.73 | 3.88 | 3.88 | 3.68 | 3.68 | 5.28 | 3.63 | 4.58 | 4.63 |
| ..... | 3.62 | 3.72 | 3.72 | 3.47 | 3.47 | 5.07 | 3.38 | 4.32 | 4.52 |
| ity ..... | 4.05 | 4.15 | 4.15 | 4.00 | 4.00 | 5.60 | 3.90 | .... | 5.00 |
| ..... | 3.90 | 4.00 | 4.00 | 3.95 | 3.95 | 5.71 | 3.75 | .... | 5.00 |
| ga ..... | 3.80 | 3.90 | 3.90 | 3.85 | 3.85 | 5.80 | 3.65 | .... | 4.40 |
| la. ..... | 4.54 | 4.64 | 4.64 | 4.41 | 4.41 | 6.01 | 4.32 | .... | 5.29 |
| am, Ala. ..... | 3.50 | 3.60 | 3.60 | 3.55 | 3.55 | 5.88 | 3.35 | .... | 4.85 |
| ans ..... | 3.85 | 4.65 | 4.65 | 3.80 | 3.80 | 5.75 | 4.10 | .... | 4.60 |
| Tex. ..... | 3.50 | 5.85 | 6.25 | 4.05 | 4.05 | 5.65 | 3.95 | .... | 5.25 |
| ..... | 3.65 | 3.85 | 5.20 | 3.40 | 3.50 | 5.25 | 3.70 | .... | 4.75 |
| Oreg. ..... | 4.00 | 4.40 | 6.10 | 4.00 | 4.00 | 5.50 | 3.95 | 6.50 | 4.75 |
| les ..... | 4.00 | 4.50 | 6.35 | 4.00 | 4.00 | 6.20 | 4.20 | 6.30 | 4.75 |
| isco ..... | 3.50 | 3.90 | 6.00 | 3.45 | 3.45 | 5.05 | 3.45 | 6.40 | 5.15 |

| | Cold Rolled Strip | Cold Finished Bars | SAE Hot-rolled Bars (Unannealed): 1035-1050 | 2300 Series | 3100 Series | 4100 Series | 6100 Series | SAE: Cold Drawn Bars 2300 | 3100 |
|---|---|---|---|---|---|---|---|---|---|
| l | 3.46 | 4.13 | 4.18 | 7.50 | 6.05 | 5.80 | 7.90 | 8.63 | 7.23 |
| ..... | 3.51 | 4.09 | 4.04 | 7.35 | 5.90 | 5.65 | .... | 8.59 | 7.19 |
| hia ..... | 3.66 | 4.06 | 3.85 | 7.31 | 5.86 | 5.61 | 8.56 | .... | .... |
| ..... | .... | 4.05 | 3.85 | .... | .... | .... | .... | .... | .... |
| Va. ..... | .... | 4.15 | .... | .... | .... | .... | .... | .... | .... |
| ..... | 3.42 | 3.75 | 3.75 | 7.10 | 5.65 | 5.40 | 8.50 | 8.15 | 6.75 |
| n ..... | 3.35 | 3.65 | 3.35 | 7.20 | 5.75 | 5.70 | 7.75 | 8.25 | 6.85 |
| ..... | 3.20 | 3.75 | 3.30 | 7.30 | 5.85 | 5.85 | 7.70 | 8.15 | 6.75 |
| ..... | 3.40 | 3.80 | 3.38 | 7.42 | 5.97 | 5.72 | 7.19 | 8.45 | 7.05 |
| l ..... | 3.45 | 4.00 | 3.65 | 7.44 | 5.99 | 5.74 | 8.84 | 8.50 | 7.10 |
| ..... | 3.65 | 3.75 | 3.65 | 7.10 | 5.65 | 5.40 | 7.50 | 8.15 | 6.75 |
| lis ..... | .... | 4.34 | 3.90 | 7.45 | 6.00 | 8.59 | 9.19 | 8.84 | 7.44 |
| e ..... | . | 3.93 | 3.93 | 7.48 | 6.08 | 5.83 | 7.88 | 8.48 | 7.08 |
| ..... | 3.61 | 4.02 | 3.82 | 7.47 | 6.02 | 5.77 | 7.87 | 8.52 | 7.12 |
| ity ..... | .... | 4.30 | .... | . | . | .... | .... | .... | .... |
| ..... | .... | 4.31 | .... | .... | .... | .... | .... | .... | .... |
| ga ..... | .... | 4.39 | .... | .... | .... | .... | .... | .... | .... |
| la. ..... | .... | 4.79 | .... | .... | .... | .... | .... | .... | .... |
| am, Ala. ..... | .... | 4.43 | .... | .... | .... | .... | .... | .... | .... |
| ans ..... | 5.00 | 5.10 | .... | .... | .... | .... | .... | .... | .... |
| ..... | .... | 5.60 | 5.65 | .... | 7.80 | 7.65 | 8.45 | .... | .... |
| Oreg. ..... | .... | 5.60 | 6.10 | 9.00 | 8.00 | 7.85 | 8.70 | .... | .... |
| les ..... | 4.45 | 6.60 | 4.65 | 9.40 | 8.55 | 8.40 | 9.05 | 10.40 | 9.55 |
| cisco..... | *9.30 | 6.55 | 4.50 | 9.65 | 8.80 | 8.65 | 9.30 | 10.65 | 9.80 |

ed on minimum quantity.

# CURRENT IRON AND STEEL PRICES OF EUROPE

**Dollars at Rates of Exchange, June 15**

## Prices f. o. b. Port of Dispatch—

*By Cable or Radio*

| | British gross tons U. K. ports £ s d | Quoted in dollars at current value | Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d |
|---|---|---|---|
| 0-3.00 Si... | $23.40 5 0 0 | $18.32 | 2 3 0 |
| er..... | ..... ..... | 17.89 | 2 2 0 |
| ios. .03-.05 | 26.91 5 15 0* | ..... | ..... |
| ..... | $34.52 7 7 6 | $38.34 | 4 10 0 |
| o. 5 gage.. | 53.24 11 7 6 | 42.60 | 5 0 0 |
| s..... | $44 46 9 10 0 | $48.99 | 5 15 0 |
| rs..... | 2.30c 11 0 0 | 1.95c to 1.98c | 5 2 6 to 5 4 0 |
| apes..... | 2.09c 10 0 0 | 1.76c to 1.85c | 4 12 6 to 4 17 6 |
| . or 5 mm. | 2.29c 10 18 9 | 2.14c to 2.33c | 5 12 6 to 6 2 6 |
| s, 24 gage | | | |
| ..... | 2.72c 13 0 0 | 2.95c | 7 15 0* |
| 4 ga., corr. | 3.29c 15 15 0 | 3.52c | 9 5 0 |
| rips..... | 2.77c 13 5 0 | 1.95c to 2.00c | 5 2 6 to 5 5 0 |
| ase..... | 4.08c 19 10 0 | 2.33c to 2.76c | 6 2 6 to 7 5 0 |
| ire, base.. | 4.86c 23 5 0 | 2.99c to 3.09c | 7 17 6 to 8 2 6 |
| ase..... | ..... ..... | 2.66c to 2.85c | 7 0 0 to 7 10 0 |
| x 108 lbs. | $ 4.74 1 0 3 | .... | ..... |

omanganese $80.00 delivered Atlantic seaboard duty-paid.

## Domestic Prices at Works or Furnace—

*Last Reported*

| | £ s d | | French Francs | | Belgian Francs | | Reich Mark |
|---|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5 | $23.17 | 4 19 0(a) | $16.61 | 626.75 | $17.00 | 500 | $25.27 63 |
| Basic bess. pig iron.. | 21.65 | 4 12 6(a) | ..... | .... | ..... | ... | 27.88 (b) 69.50 |
| Furnace coke..... | 5.38 | 1 4 2 | 5.96 | 225 | 6.87 | 202 | 7.62 19 |
| Billets..... | 34.52 | 7 7 6 | 25.04 | 945 | 29.24 | 860 | 38.71 96.50 |
| Standard rails..... | 1.99c | 9 10 0 | 1.56c | 1,300 | 2.06c | 1,375 | 2.38c 132 |
| Merchant bars..... | 2.42c | 11 12 0†† | 1.44c | 1,202 | 1.65c | 1,100 | 1.98c 110 |
| Structural shapes... | 2.17c | 10 8 0†† | 1.41c | 1,173 | 1.65c | 1,100 | 1.93c 107 |
| Plates, †¼-in. or 5 mm..... | 2.29c | 10 19 3†† | 1.82c | 1,515 | 2.06c | 1,375 | 2.29c 127 |
| Sheets, black..... | 3.08c | 14 15 0§ | 2.17c | 1,805‡ | 2.36c | 1,575‡ | 2.59c 144‡ |
| Sheets, galv., corr., 24 ga. or 0.5 mm..... | 3.61c | 17 5 0 | 3.30c | 2,750 | 4.13c | 2,750 | 6.66c 370 |
| Plain wire..... | 4.08c | 19 10 0 | 1.74c | 1,450 | 2.48c | 1,650 | 3.11c 173 |
| Bands and strips... | 2.58c | 12 7 0†† | 1.61c | 1,340 | 1.95c | 1,300 | 2.29c 127 |

*Basic. †British ship-plates. Continental, bridge plates. $24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

# IRON AND STEEL SCRAP PRICES

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers pric*

**HEAVY MELTING STEEL**

| | |
|---|---|
| Birmingham, No. 1 | †12.00 |
| Bos. dock No. 1 exp. | 13.75-14.00 |
| New Eng. del. No. 1 | 14.00 |
| Buffalo, No. 1, R. R. | 13.50-14.00 |
| Buffalo, No. 1 | 13.00-13.50 |
| Buffalo, No. 2 | 11.00-11.50 |
| Chicago, No. 1 | 13.25-13.75 |
| Chicago, auto, no alloy | 12.00-12.50 |
| Chicago, No. 2 auto | 10.50-11.00 |
| Cincinnati, dealers | 11.00-11.50 |
| Cleveland, No. 1 | 13.75-14.25 |
| Cleveland, No. 2 | 12.50-13.00 |
| Detroit, No. 1 | 9.50-10.00 |
| Detroit, No. 2 | 9.00- 9.50 |
| Eastern Pa., No. 1 | 15.50 |
| Eastern Pa., No. 2 | 13.00-13.50 |
| Federal, Ill. | 11.25-11.75 |
| Granite City, R. R. | 11.25-11.75 |
| Granite City, No. 2 | 10.50-11.00 |
| Los Angeles, No. 1 | 13.00-14.00 |
| Los Angeles, No. 2 | 12.00-13.00 |
| N. Y. dock No. 1 exp. | 12.00-12.50 |
| Pitts., No. 1 (R. R.) | 16.00-16.50 |
| Pittsburgh, No. 1 | 15.00-15.50 |
| Pittsburgh, No. 2 | 13.50-14.00 |
| St. Louis, R. R. | 11.50-12.00 |
| St. Louis, No. 2 | 10.50-11.00 |
| San Francisco, No. 1 | 13.00-13.50 |
| Seattle, No. 1 | 11.00-12.00 |
| Toronto, dlrs. No. 1 | 9.25- 9.75 |
| Valleys, No. 1 | 14.50-15.00 |

**COMPRESSED SHEETS**

| | |
|---|---|
| Buffalo | 11.00-11.50 |
| Chicago, factory | 12.50-13.00 |
| Chicago, dealers | 11.50-12.00 |
| Cincinnati dealers | 10.50-11.00 |
| Cleveland | 13.75-14.25 |
| Detroit | 11.00-11.50 |
| E. Pa., new mat. | 15.50 |
| E. Pa., old mat. | 11.50-12.00 |
| Los Angeles | 14.00-14.50 |
| Pittsburgh | 15.00-15.50 |
| St. Louis | 9.50-10.00 |
| Valleys | 14.00-14.50 |

**BUNDLED SHEETS**

| | |
|---|---|
| Buffalo, No. 1 | 11.00-11.50 |
| Buffalo, No. 2 | 10.00-10.50 |
| Cleveland | 9.50-10.00 |
| Los Angeles | 14.00 |
| Pittsburgh | 13.50-14.00 |
| St. Louis | 7.00- 7.50 |
| Toronto, dealers | 8.00- 8.50 |

**SHEET CLIPPINGS, LOOSE**

| | |
|---|---|
| Chicago | 8.00- 8.50 |
| Cincinnati, dealers | 6.50- 7.00 |
| Detroit | 7.50- 8.00 |
| †Los Angeles | 3.75- 4.00 |
| St. Louis | 6.00- 6.50 |
| Toronto, dealers | 4.25- 4.75 |

**BUSHELING**

| | |
|---|---|
| Buffalo, No. 1 | 11.00-11.50 |
| Chicago, No. 1 | 12.00-12.50 |
| Cincin., No. 1, deal. | 7.00- 7.50 |
| Cincinnati, No. 2 | 2.25- 2.75 |
| Cleveland, No. 2 | 7.50- 8.00 |
| Detroit, No. 1, new | 10.00-10.50 |
| Valleys, new, No. 1 | 13.50-14.00 |
| Toronto, dealers | 3.75- 4.25 |

**MACHINE TURNINGS (Long)**

| | |
|---|---|
| Birmingham | †4.50- 5.00 |
| Buffalo | 6.00- 6.50 |
| Chicago | 7.00- 7.50 |
| Cincinnati, dealers | 4.50- 5.00 |
| Cleveland, no alloy | 7.25- 7.75 |
| Detroit | 5.00- 5.50 |
| Eastern Pa. | 8.50 |
| Los Angeles | 4.50- 5.00 |
| New York | †3.50- 4.00 |
| Pittsburgh | 8.00- 8.50 |
| St. Louis | 4.00- 4.50 |
| Toronto, dealers | 4.25- 4.75 |
| Valleys | 9.00- 9.50 |

**SHOVELING TURNINGS**

| | |
|---|---|
| Buffalo | 7.25- 7.75 |
| Cleveland | 7.50- 8.00 |
| Chicago | 7.00- 7.50 |
| Chicago, spcl. anal. | 8.00- 8.50 |
| Detroit | 6.00- 6.50 |
| Pitts., alloy-free | 9.50-10.00 |

**BORINGS AND TURNINGS**

*For Blast Furnace Use*

| | |
|---|---|
| Boston district | 2.00 |
| Buffalo | 6.75- 7.25 |
| Cincinnati, dealers | 3.25- 3.75 |
| Cleveland | 7.50- 8.00 |
| Eastern Pa. | 6.50- 7.00 |
| Detroit | 5.00- 5.50 |
| New York | †2.50- 3.00 |
| Pittsburgh | 6.50- 7.00 |
| Toronto, dealers | 3.50- 4.00 |

**AXLE TURNINGS**

| | |
|---|---|
| Boston district | †7.50 |
| Buffalo | 9.50-10.00 |
| Chicago, elec. fur. | 13.50-14.00 |
| East. Pa., elec. fur. | 13.00-13.50 |
| St. Louis | 9.00- 9.50 |
| Toronto | 4.00- 4.25 |

**CAST IRON BORINGS**

| | |
|---|---|
| Birmingham | †6.00- 6.50 |
| Boston dist. chem. | †4.50 |
| Buffalo | 6.75- 7.25 |
| Chicago | 6.50- 7.00 |
| Cincinnati, dealers | 3.25- 3.75 |
| Cleveland | 7.50- 8.00 |
| Detroit | 5.00- 5.50 |
| E. Pa., chemical | 10.00-11.00 |
| New York | †3.50- 4.00 |
| St. Louis | 2.50- 3.00 |
| Toronto, dealers | 3.75- 4.25 |

**RAILROAD SPECIALTIES**

| | |
|---|---|
| Chicago | 15.25-15.75 |

**ANGLE BARS—STEEL**

| | |
|---|---|
| Chicago | 15.25-15.75 |
| St. Louis | 13.00-13.50 |

**SPRINGS**

| | |
|---|---|
| Buffalo | 15.50-16.00 |
| Chicago, coil | 16.50-17.00 |
| Chicago, leaf | 15.00-15.50 |
| Eastern Pa. | 18.00 |
| Pittsburgh | 18.00-18.50 |
| St. Louis | 14.00-14.50 |

**STEEL RAILS, SHORT**

| | |
|---|---|
| Birmingham | †12.00-12.50 |
| Buffalo | 16.50-17.00 |
| Chicago (3 ft.) | 16.00-16.50 |
| Chicago (2 ft.) | 16.50-17.00 |
| Cincinnati, dealers | 16.75-17.25 |
| Detroit | 16.50-17.00 |
| Los Angeles | 15.00-15.50 |
| Pitts., 3 ft. and less | 18.50-19.00 |
| St. Louis, 2 ft. & less | 16.25-16.75 |

**STEEL RAILS, SCRAP**

| | |
|---|---|
| Boston district | †13.50-14.00 |
| Buffalo | 15.50-16.00 |
| Chicago | 13.50-14.00 |
| Cleveland | 16.50-17.00 |
| Pittsburgh | 16.00-16.50 |
| St. Louis | 13.00-13.50 |
| Seattle | 16.00 |

**FROGS, SWITCHES**

| | |
|---|---|
| Chicago | 13.50-14.00 |
| St. Louis, cut | 13.00-13.50 |

**ARCH BARS, TRANSOMS**

| | |
|---|---|
| St. Louis | 13.50-14.00 |

**PIPE AND FLUES**

| | |
|---|---|
| Chicago, net | 8.50- 9.00 |
| Cincinnati, dealers | 6.50- 7.00 |

**RAILROAD GRATE BARS**

| | |
|---|---|
| Buffalo | 9.00- 9.50 |
| Chicago, net | 7.50- 8.00 |
| Cincinnati, dealers | 6.25- 6.75 |
| Eastern Pa. | 12.50-13.00 |
| New York | †8.50- 9.00 |
| St. Louis | 8.00- 8.50 |

**RAILROAD WROUGHT**

| | |
|---|---|
| Birmingham | †11.00-11.50 |
| Boston district | †9.50-10.00 |
| Eastern Pa., No. 1 | 16.00-16.50 |
| St. Louis, No. 1 | 9.75-10.25 |
| St. Louis, No. 2 | 11.50-12.00 |

**FORGE FLASHINGS**

| | |
|---|---|
| Boston district | †7.50 |
| Buffalo | 11.00-11.50 |
| Cleveland | 11.00-11.50 |
| Detroit | 9.00- 9.50 |
| Los Angeles | 9.00 |
| Pittsburgh | 13.50-14.00 |

**FORGE SCRAP**

| | |
|---|---|
| Boston district | †6.50 |
| Chicago, heavy | 15.50-16.00 |

**LOW PHOSPHORUS**

| | |
|---|---|
| Cleveland, crops | 17.50-18.00 |
| Eastern Pa., crops | 17.00-17.50 |
| Pitts., billet, bloom, slab crops | 19.00-19.50 |

**LOW PHOS. PUNCHINGS**

| | |
|---|---|
| Buffalo | 15.50-16.00 |
| Chicago | 15.50-16.00 |
| Eastern Pa., crops | 17.50-18.00 |
| Pittsburgh | 17.50-18.00 |
| Seattle | 15.00 |

**RAILS FOR ROLLING**

*5 feet and over*

| | |
|---|---|
| Birmingham | †14.00-15.00 |
| Boston | 15.00-15.50 |
| Chicago | 17.50-18.00 |
| New York | †14.00-14.50 |
| Eastern Pa. | 17.00-17.50 |
| St. Louis | 16.00-16.50 |

**STEEL CAR AXLES**

| | |
|---|---|
| Birmingham | †15.00-16.00 |
| Boston district | †14.50 |
| Chicago, net | 17.50-18.00 |
| Eastern Pa. | 20.50-21.00 |
| St. Louis | 16.00-16.50 |

**LOCOMOTIVE TIRES**

| | |
|---|---|
| Chicago (cut) | 15.50-16.00 |
| St. Louis, No. 1 | 12.25-12.75 |

**SHAFTING**

| | |
|---|---|
| Boston district | †15.25-15.50 |
| New York | †15.50-16.00 |
| Eastern Pa. | 2 |
| St. Louis, 1¼-3¾" | 1 |

**CAR WHEELS**

| | |
|---|---|
| Birmingham | †1 |
| Boston dist., iron | |
| Buffalo, steel | 1 |
| Chicago, iron | 1 |
| Chicago, rolled steel | 1 |
| Cincin., iron, deal | 1 |
| Eastern Pa., iron | 1 |
| Eastern Pa., steel | |
| Pittsburgh, iron | 1 |
| Pittsburgh, steel | 1 |
| St. Louis, iron | 1 |
| St. Louis, iron | 1 |

**NO. 1 CAST SCRAP**

| | |
|---|---|
| Birmingham | †1 |
| Boston, No. 1 mach. | †1 |
| N. Eng. del. No. 2 | 1 |
| N. Eng. del. textile | 1 |
| Buffalo, cupola | 1 |
| Buffalo, mach. | 1 |
| Chicago, agri. net | |
| Chicago, auto net | 1 |
| Chicago, railroad net | 1 |
| Chicago, mach. net | 1 |
| Cincin., mach. deal. | 1 |
| Cleveland, mach. | 1 |
| Detroit, cupola, net | 1 |
| Eastern Pa., cupola | 1 |
| E. Pa., mixed yard | 1 |
| Los Angeles, net | 1 |
| Pittsburgh, cupola | 1 |
| San Francisco, del. | 1 |
| Seattle | 1 |
| St. Louis, cupola | 1 |
| St. Louis, agri. mach. | 1 |
| St. L., No. 1 mach. | 1 |
| Toronto, No. 1, mach., net | 1 |

**HEAVY CAST**

| | |
|---|---|
| Boston dist. break. | |
| New England, del. | 1 |
| Buffalo, break. | 1 |
| Cleveland, break, net | 1 |
| Detroit, auto net | 1 |
| Detroit, break | |
| Eastern Pa. | |
| Los Ang., auto, net | |
| New York, break. | †1 |
| Pittsburgh, break | 1 |

**STOVE PLATE**

| | |
|---|---|
| Birmingham | † |
| Boston district | † |
| Buffalo | 1 |
| Chicago, net | |
| Cincinnati, dealers | |
| Detroit, net | |
| Eastern Pa. | 1 |
| New York, fdy. | †1 |
| St. Louis | |
| Toronto dealers, net | |

**MALLEABLE**

| | |
|---|---|
| Birmingham, R. R. | †1 |
| New England, del. | 1 |
| Buffalo | 1 |
| Chicago, R. R. | 1 |
| Cincin., agri., deal. | 1 |
| Cleveland, rail | 1 |
| Eastern Pa., R. R. | 1 |
| Los Angeles | 1 |
| Pittsburgh, rail | 1 |
| St. Louis, R. R. | 1 |

## Iron Ore

**Lake Superior Ore**

*Gross ton, 51½%*

*Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.25 |
| Mesabi nonbessemer | 4.95 |
| High phosphorus | 4.85 |
| Mesabi bessemer | 5.10 |
| Old range nonbessemer | 5.10 |

**Eastern Local Ore**

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.63% con. | 9.00-9.25 |
| Cop.-free low phos. 58-60% | nominal |

**Foreign Ore**

*Cents per unit, c.i.f. Atlantic*

| | |
|---|---|
| Foreign manganiferous ore, 45.55% iron, 6-10% man. nom. | 12.00 |
| No. Afr. low phos. | 12.00 |
| Swedish low phos. | 12.00 |
| Spanish No. Africa basic, 50 to 60% nom. | 10.00-10.50 |
| Tungsten, short ton unit, duty pd. nom. | $17.50-18.00 |
| N. F., fdy., 55% | 7.00 |
| Chrome ore, 48% gross ton, c.i.f. | $23.00-24.00 |
| Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill | |

## Manganese Or

Prices not including d per unit cargo

| | |
|---|---|
| Caucasian, 50-52% nom. | |
| So. African, 50-52% nom. | |
| Indian, 49-50% | 2 |

# eets, Strip

**and Strip Prices, Pages 82, 83**

**urgh**—Sheet and strip ship- continue to gain slowly with- efit of heavy automotitve re- The latter are overshad- y increased miscellaneous de- Production is steady, sheet olding at 55 per cent and ear 35. Galvanized output lined further to 50 per cent. r outlook is for sustained perations.

**land** — Flat-rolled steel de- are fairly heavy, swelled by vement of low-price tonnage a few weeks ago. Ship- nclude only a small amount motive material. Releases artsmakers for 1940 models reasing, but demand from ompanies is expected to be ly light for another 60 days, accompanying retarding ef- otal production of sheets and Prices are regaining stability tested by only small lots.

**go**—Flat-rolled steel releases avier. Automobile builders artsmakers are specifying eavily than was expected by heet producers but are not on for substantial lots until arter. New business is light.

**n**—New buying is light, but tions are heavier, resulting increase in output of cold ostly from consumers out- w England. Demand from of small tanks and contain- ight and stampers' require- lso are off slightly.

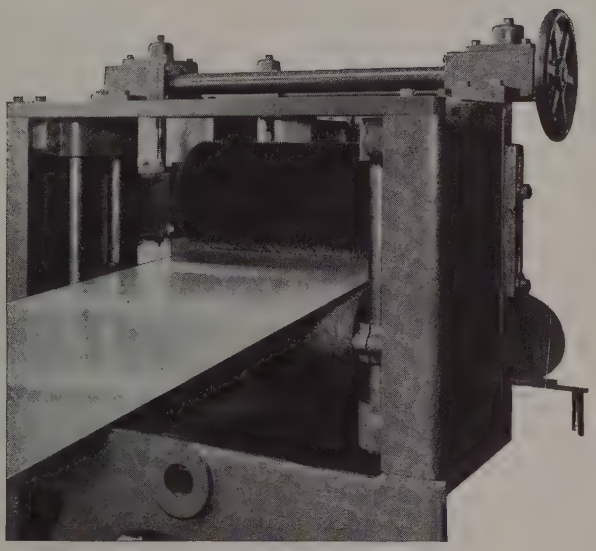
**York**—Sheet specifications avier than expected. Re- om household appliance and ors and door bucks makers ding up well, reflecting im- activity in small apartment dential building. Prices are . Recent reports of addi- nsettlement apparently had ception in adjustments to rs who did not receive the prices that prevailed subse- the placing of certain or- t month. Such adjustments med to have been granted tonnages placed during the art of the breakdown in nd to have involved no in- n size of original orders.

cold strip prices are grad- ing steadied, some business 00c, Worcester, continues to although current buying is d spotty. Producers are for releases on low-price booked recently.

**elphia**—Sheet specifications , exceeding those a month


STEP UP PRODUCTION

CUT FINISHING COSTS



MANUFACTURERS of light gauge metal save *two* ways when they install Pittsburgh Plate Glass Company's Spiral Wound Brushes on their production lines. Such an installation never fails to increase output and to bring a substantial reduction in finishing expense.

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PITTSBURGH
PLATE GLASS COMPANY
BRUSH DIVISION · BALTIMORE, MD.

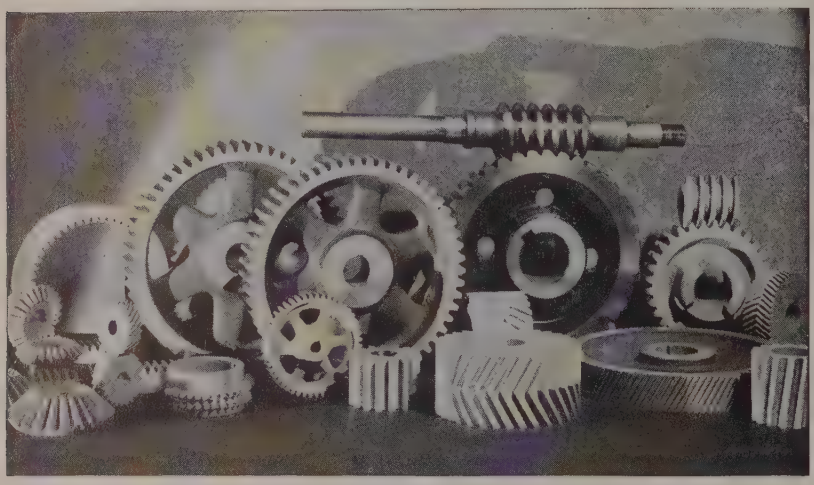
ago. New orders are light. Specifications from radio set builders are active.

**Buffalo**—Sheet and strip production is fairly active, with releases coming through satisfactorily, but some letup is seen not improbable when books are cleared of low-price tonnage. Automotive demand largely covers fill-in needs for the remainder of current model production.

**Cincinnati** — Sheet specifications barely represent 50 per cent of capacity, with automotive releases lighter than usual. New business continues fair despite backlogs acquired during the recent price dip. Galvanized sheet shipments are disappointing.

**St. Louis** — Specifications for sheets and strip are steady, with new business lagging. Most leading consumers are well covered for third quarter. Better business in galvanized sheets is looked for next month, when farm repair work gets under way.

**Birmingham, Ala.** — Output of sheets is estimated at slightly better than 60 per cent, the large roofing. A slight increase i duction of strip, due to appro the cotton season, also is not

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# Plates

**Plate Prices, Page 82**

**Boston**—Plate buying is lig cept from shipbuilders. At le 000 tons is included for releas the next year or more by shipyards. Structural, boile miscellaneous fabricating sho buying sparingly. Prices ar subject to shading of about $ erally through waiving of ex other indirect means, althoug base concessions are noted.

**New York**—Plate orders ar ty and include few im awards. Outstanding in pros railroad buying are 1110 freig for the Western Maryland, bid 22. District shipyards are pected to be in a position to on building of 12 merchant on which the maritime comm will open bids July 11 and whi take about 30,000 tons of steel ly plates. Prices continue so

**Philadelphia**—Buying is sl although the Reading Co. has ed distribution of 500 tons. releases, slow lately, are expe be stimulated by new work uled to start soon at Chest Pennsylvania railroad has buy 500 tons of plates for 25 it will build or material for comotives it plans to repair.

**Birmingham, Ala.**—Plate ings have shown some increa to orders from drum manufa and some miscellaneous bu Output is estimated at about cent.

**San Francisco**—The only p plate business of size calls f tons for a penstock near S Calif., for Pacific Gas & Elect San Francisco. Awards and inquiries are limited to lots than 100 tons. So far this 17,249 tons have been placed pared with 14,246 tons for th period a year ago.

## Plate Contracts Placed

205 tons, municipal standpipe, O., to Warren City Tank & Bo Warren, O.

## Plate Contracts Pendi

400 tons, penstock for Pacific Electric Co., near Sonora, Cal opened.

## Bolts, Nuts, Rivets

**Bolt, Nut, Rivet Prices, Page**

Bolt and nut producers i

s have yet to open third books, although some buy- e requested contracts. Sell- under little pressure to ac- rward orders and apparently to await clarification of the tuation before naming quo- for the next period.

## rs

Bar Prices, Page 82

**land**—Bar demand is quieter e directions, volume being han for several weeks. New preparations in the automo- dustry are accompanied by ains in releases from parts- but so far only small lots olved and direct buying re- proaching completion of cur- odel assemblies. Alloy bar rs have increased prices on m quantities, although the uotation is unchanged. Un- revised schedule quantities pounds and less take ware- rices. Formerly mills charged ne as warehouses on lots of unds and less.

**go**—Carbon and alloys bars ver, tapering closely with au- e and agricultural equip- interests' declining needs. equipment requirements are d to slacken further the next , but automotive needs may slight improvement when tions are made for early new models.

**n**—Consumers are operating on stocks, with requirements htly. Nearly 100 tons of teel and other alloy bars has aced by the Boston navy yard in-making. Shipbuilding re- re well maintained.

**delphia** — Commercial bar again are advising large buyers that the previously ced advance of $1 a ton on m quantities will go into ef- y 1, thus refuting recent re- the contrary.

**ingham, Ala.**—Due in main tonnage accruing from mis- us construction projects in a and adjacent states, bar ion has held consistently 55 per cent. Demands from ural implement builders are inting.

## Plate

Tin Plate Prices, Page 82

fications continue sufficient- e to support tin plate opera- 70 per cent. While demand cted to be sustained fairly a few more weeks, produc- tion is believed to have reached its spring peak. From a production standpoint tin plate is the most active of major steel products.

## Pipe

Pipe Prices, Page 83

**Pittsburgh** — Shipments of oil country goods the first half of June were up slightly, but demand still is regarded below normal. Merchant pipe continues aided by increased building demands, movement from consigned stocks being better this month than in either April or May.

**Cleveland**—Movement of standard pipe is heavier than a month ago in some directions. Oil country demand still is light as regards drillers' requirements. Line pipe business has been fair lately, most orders being for comparatively small gathering lines. Several larger lines remain in the conversational stage, but

1. Free-acting, flexible assembly can't bind, sag, warp or pull apart. More durable!
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it is difficult to determine if and when they will materialize.

**Boston**—Moderate buying of pipe continues against plumbing and heating contracts for building work started several months ago. Most of this is going through resale outlets at steady prices, with some scattered shading in Connecticut. Cast pipe demand is slower, although eastern foundries have fair backlogs. Utility buying so far this year has been light.

**Birmingham, Ala.**—Widely scattered tonnage, mostly small lots, is holding pipe production at an even rate. Recent bookings include some tonnage from South Pasadena, Calif., Seattle and from some points in Florida. Operations are on a four and five day a week basis, and inquiries are reported fairly consistent.

**San Francisco**—Awards of 2895 tons of cast iron pipe were the largest so far this year, bringing the total to date to 16,366 tons, compared with 14,287 tons for the corresponding period in 1938. The East Bay Municipal Utility District, Oakland, Calif., awarded 1500 t 4 to 20-inch to United State & Foundry Co. and 250 t American Cast Iron Pipe C former was the only bidder tons for Portland, Oreg. Bid on June 19 for 138 tons of inch, cast iron or steel pi Columbia City, Oreg.

**Seattle**—H. G. Purcell, representing U. S. Pipe & F Co., will furnish 700 tons of inch water mains for the street extension, Seattle. agency is also low at Portla 200 tons of 8-inch cast iron mains.

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## Cast Pipe Placed

1750 tons, 4 to 20-inch, east bay pal utility district, Oakland, Ca tons to United States Pipe & Co., Burlington, N. J., 250 American Cast Iron Pipe Co., ham, Ala.

753 tons, 8 to 16-inch, impro West Garfield street, Seattle, Purcell, Seattle, for United Sta & Foundry Co., Burlington, N.

375 tons, 6 and 8-inch, Inglewood to United States Pipe & Foun Burlington, N. J.

## Cast Pipe Pending

200 tons, Portland, Oreg.; Unite Pipe & Foundry Co., Burlingto only bidder.

138 tons, 3 to 6-inch, cast iron Columbia City, Oreg.; bids op

Unstated tonnage, Warren ave provement, Seattle; bids soon; available.

# Wire

Wire Prices, Page 83

**Pittsburgh** — Wire produ up slightly, with June to dat what ahead of May. Howe gain is below expectations. specifications from manufa consumers account for the ment, but only small aut lots are included. Merchan ucts are moving slowly.

**Cleveland**—Wire orders ar ly better than a month ago, a latest gains have been slig tomotive requirements are tained somewhat better th anticipated a short time a it is too early for heavy de connection with new models chant products continue quiet.

**Boston**—Wire business is holding its own. Manufa wire specifications are stea the number of specialty or impressive though demand is Merchant products continue distributors generally havi ered heavily earlier in the yea rod volume has slackened. shading is reported on fla

ectrical building wire prices weak.

**York**—Some forward buying ufacturers' wire for third delivery has developed, but whole volume reaching the arely maintained with more ers preparing for a slower ext month. Little business ng from the automobile in- Rods and flat wire special- inclined to drag. Export for rods has appeared re- ut at unattractive prices.

**ngham, Ala.**—Wire demand, aratively small orders, con- econd to sheets. Output, , has slackened somewhat e peak attained earlier in r. Current production is 65 per cent.

## ils, Cars

**k Material Prices, Page 83**

ng of bids June 22 on 1110 cars by the Western Mary- the high point in railroad ittle other business being in veral carbuilding programs he making but have not a definite stage. Rail mills to receive some rail re- ut backlogs are being re- adily and no new inquiry is ut.

cars have been placed by l concerns, for special pur-

### ders Placed

Co. of America, ten 70-ton hoppers, to Pullman-Standard Co., Chicago.

Steel Corp., four 50-ton air- rs, to Pressed Steel Car Co., gh.

### ders Pending

Valley authority, thirty 40-ton new or used.

### tives Pending

Maine, six 600-horsepower ctric switchers.

Coke Co., three electric lo- s.

### ooked

Car & Foundry Motors Co., : Eight for Triborough Coach ria, L. I.; one for Carolina ., Raleigh, N. C.

Co., Kent, O.: Sixty-seven 40- for North Shore Bus Co., N. Y.; seven 29-passenger for e Electric Railway & Trans- Milwaukee; six 37-passenger ay Equipment & Realty Co., Calif.; five 33-passenger for otor Transit Co., East Liver-

# Shapes

**Structural Shape Prices, Page 82**

**Pittsburgh** — Activity has been somewhat less in the structural market, although tonnages remain virtually the same. Several larger jobs have been placed and two new inquiries over 1000 tons each pend.

Awards include 3600 tons to Bethlehem Steel Co., Bethlehem, Pa., for a store and office building in Rockefeller Center, New York.

Largest new inquiry is for 4500 tons of structurals for the administration building in the new municipal center in Washington.

**Chicago** — Market for structural steel appears brighter, with awards heavier and increased inquiries for small projects. Largest inquiry involves 2000 tons of structurals for contract S-3, a section of the State street subway, Chicago, bids on the general contract June 29. Also involved are liner plates and beam ribs, at least 8000 tons.

**Boston** — Inquiry for structural


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steel has slackened. Recent purchases have reduced active unplaced bridge tonnage in Vermont to approximately 400 tons. The two bridges at Hartford and New London, Conn., will take 12,000 tons each instead of 1200 tons as noted by mistake last week.

**Philadelphia** — Structural orders are light and except for a 9500-ton bridge in New Jersey, bids July 7, inquiry is featureless.

**Buffalo** — Activity in structurals has increased further. Of major interest are the first of a number of bridges and viaducts to be built the remainder of the year. Four units up this week involve more than 1200 tons. Two pending school jobs call for 750 tons.

**San Francisco**—Structural shape lettings aggregated 1159 tons, bringing the year's total to 65,816 tons, compared with 50,138 tons for the corresponding period in 1938.

## Shape Contracts Placed

3600 tons, store and office building, for Rockefeller Center Inc., New York, to Bethlehem Steel Co., Bethlehem, Pa.

2400 tons, second crossing, Sacramento river, Delta, Calif., for bureau of reclamation, to Bethlehem S Bethlehem, Pa.

870 tons, bridge, sections 12B Bedford, Pa., to American B Pittsburgh.

750 tons, incinerator plant, P for city, to Pittsburgh-De Steel Co., Pittsburgh.

600 tons, hospital for crippled Wilmington, Del., for Nemour tion, to American Bridge C burgh.

500 tons, shop-theater-office State and Randolph streets, to Bethlehem Steel Co., Bethl

422 tons, bridges, Georgetown, Mosher Steel Co., Houston,

361 tons, bridge, Nacogdoches, Bethlehem Steel Co., Bethleh

325 tons, civic center buildin Falls, Mont., to Minneapo Power Implement Co., Mi Minn.

310 tons, telephone building, Fo N. Y., to Ingalls Iron Works mingham, Ala., through W struction Co., New York.

295 tons, bridge, Kaufman, Mosher Steel Co., Houston, T

295 tons, Nazareth academy, N. Y., to F. L. Heughes & Co. ter.

265 tons, state bridges, Northe to Bethlehem Fabricators, B Pa.

260 tons, destructor plant, Mi Minn., to Minneapolis-Moli Implement Co., that city.

250 tons, state bridge, Steve Wis., to Milwaukee Bridge waukee.

240 tons, bridge FAP-450-B, Elk to Bethlehem Fabricators, B Pa.

235 tons, bureau of reclamatio cation 1217D, item 2, New M Thompson Mfg. Co., Denver.

230 tons, Black river bridge, field, Vt., American Bridge C burgh.

230 tons, state turnpike commis ton county, Pennsylvania, to B Steel Co., Bethlehem, Pa.

230 tons, redecking, Dodge stre Omaha, Nebr., to Omaha Ste Omaha.

225 tons, addition, Chrysler M California, Los Angeles, to B Steel Co., Los Angeles.

205 tons, Fleetwood viaduct, M non, N. Y., to American Br Pittsburgh, through Bronx Works Corp., New York.

200 tons, building, Central Par Corp., New York, to Dreier S Steel Co., New York.

200 tons, jail, Washington, fo of Columbia, to Bethlehem S

## Shape Awards Comp

| | |
|---|---|
| **Week ended June 17** | |
| **Week ended June 10** | |
| **Week ended June 3** | |
| **This week, 1938** | |
| **Weekly average, year, 193** | |
| **Weekly average, 1939** | |
| **Weekly average, May** | |
| **Total to date, 1938** | |
| **Total to date, 1939** | |

Includes awards of 100 tons o

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DETROIT 335 Curtis Bldg.
CHICAGO 549 Washington Blvd.
INDIANAPOLIS 335 Postal Station Bldg.
FRANCE Fenwick, S. A.
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hem, Pa.
, hospital buildings, Phelps Corp., Morenci and Douglas, o Midwest Steel & Iron Works,

one 200-ton traveling gantry water and power department, geles, to Harnischfeger Corp., kee.
central heating plant, Rantoul, Duffin Iron Works, Chicago.
plant addition, Garlock Packing lmyra, N. Y., to F. L. Heughes Rochester.
home economics building, Lex- Ky., to Louisville Bridge & ., Louisville, Ky.
auditorium, Beatrice, Neb., St. Structural Steel Co., St. Joseph,

building, American Cyanamid amazoo, Mich., to Whitehead & Detroit.
Remsen avenue bridge, Los county, California, for state, nsolidated Steel Corp., Los

wharf extension, Iona Island, rk, to Harris Structural Steel w York, through O'Day Con- n Co., New York.
municipal building, North Tar- N. Y., to Levine Bros. Iron New York, through Charles a Co.
hospital buildings, Cincinnati, state, to Pittsburgh Bridge & rks, Rochester, Pa.
bridge over Canyon creek, Mont., for Northern Pacific to American Bridge Co., Pitts-

bridge, FAGH-264-B, Eddy North Dakota, to American Co., Pittsburgh.
four oil derricks, Union Pacific Co., Long Beach, Calif., to l interest.

## Contracts Pending

superstructure bridge, Raritan ayreville-Woodbridge, N. J., section 14, involving 29 plate teel spans from 84 feet, six o 250 feet, overall 4386 feet; y 7, E. Donald Sterner, state commissioner, Trenton; work udes 200 tons of steel castings; ar feet of railing; 7100 pounds ron castings, and 6100 pounds ural aluminum.
administration building, mu- nter, Washington, for District bia.
steel sheet piling, flood control lyoke, Mass.; Daniel O'Con- ns Co., Holyoke, general con-

state bridges, New York; bids Albany.
state bridge over Scioto river, e, O.
Coulee dam power house; Bridge Co. low.
vo 350-ton overhead traveling pecification 851, Grand Coulee shington; bids July 10.
including machinery, state hohomish river, Washington; Construction & Engineering le, general contractor.
state bridge 5273, Cloquet,

ate bridge, Milford, O.
ate bridge FAGH-8529, Rock-
even state highway bridges,

Wisconsin, bids June 20.
475 tons, bridge, Allegheny county, New York; bids June 21.
400 tons, public school No. 18, Buffalo, Metzger Construction Corp., Buffalo, low on general contract.
375 tons, bridges, Somerset county, Pennsylvania, for Pennsylvania turnpike commission.
330 tons, Y. M. C. A., Wilmington, Del.
325 tons, warehouse, for Wamkill Realty Corp., Bronx, New York.
300 tons, bridge, Southern parkway, Queens, N. Y.
300 tons, Fredonia state normal school, Fredonia, N. Y., J. M. Benzinger, Jamestown, N. Y., low on general contract.
300 tons, Southern parkway bridge, Queens, New York.
275 tons, state hospital building, Cleveland.
265 tons, highway bridge, Coinjock, N. C., for army engineers.
265 tons, repairs to bridges, various locations, for Atchison, Topeka & Santa Fe railway.
250 tons, bridge, Hamilton county, New York; bids June 21.
250 tons, state bridge RC-4017, Sebattis, N. Y.
250 tons, bridges, Fulton county, Pennsylvania, for Pennsylvania turnpike commission.
250 tons, viaduct, River avenue, Pittsburgh, for city.
230 tons, bridge, Oswego county, New York; bids June 21.
225 tons, building, for Gardner-Denver

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# Behind the Scenes with STEEL

### Thought Provokers

■ Beginning on page 23 of this issue is the third successive lead article appearing in STEEL of such penetrating interest to every thinking man in business that we urge you to make sure you and your associates read them without fail. Senator Tyding's address in the June 5 issue has created such interest that thousands of reprints have already gone out from this office with orders still piling up. Pittsburgh editor Hartford's study of steel's present technical and financial position in the June 12 issue has been widely received as an excellent reflection of the industry's status and provoked favorable comment from top men the country over. And now, it is agreed by everyone with whom we've talked, Walter Lippman, in his masterful article on The American Destiny does more to clarify the nation's thinking (and each of ours individually) than anything yet written. If you do nothing else today, read The American Destiny.

### Star Reporter

■ A couple of weeks ago we told you (or tried to) all about the 63rd Annual bull fight, ox roast, and Wintersteen birthday party. With blushing shame we now learn that aside from the title given Mr. Wintersteen, the road with which he is connected, the ownership of the Cornwall & Lebanon railroad, and the fact there were no live bulls present, our story was correct in every respect, namely that there was a Wintersteen birthday party in Lebanon. (Or was it Oshkosh?)

### Over Our Head

■ Snooping around behind the editorial scenes last week we snooped right into a battle royal on whether the unit for moment of turning or torque is the "pound - foot," "pound - inch," "ounce-inch," etc. in distinction to "foot-pound," "inch-pound," etc. used for units of work. It all centered around a news release in which the company had brazenly (so one battler thought) used foot-pounds for torque. School books for the ash can, said they, and shoved out for contrary evidence a pile of engineering handbooks actually used in practice. About this time we heard mamma calling us and ducked out. It all made about as much sense to us as the threat to break up the Yankees because they're too good.

### With Plenty of Brass

■ From the May issue of the *Highway* magazine comes a definition of a dictator we should have thought of ourselves long ago: *An iron man on a steal job.*

### Gourmet's Delight

■ Apparently we started something by tagging the Smithville, Ohio Inn as the *largest, most famous* and *best* chicken dinner house in America. Readers with an avocation for home-style chicken dinners seem to doubt our word slightly but we still say their slogan is a gross understatement.

### Shovel-Leaning

■ With no intention of turning this little patch of ours into a lecture hall, nor with any loss of love for a good W. P. A. story, we still like this beginning of a sales letter just received: "It is altogether possible that the gibes at W. P. A. are neither just nor funny but even were they so, it is not there alone that shovel-leaning is done. American business also has its shovels on which at times it leans. One of the worst shovels on which business is tempted to lean is the expectation of an 'upturn next autumn, sometime.' Upturns are created, they don't just happen." And again we say, turn back to page 23 and let Mr. Lippman paint his picture for you.

SHRDLU



Corp., Quincy, Ill.

215 tons, buildings, Quincy, M
Procter & Gamble Co.

200 tons, grade crossing eliminati
falo; bids June 19.

170 tons, leanto, etc., specificati
Philadelphia, for U. S. navy.

160 tons, state bridge, route 5, se
New Jersey; bids June 23.

145 tons, department of public
Chicago.

135 tons, state highway bridge,
burg, Ill., bids in.

133 tons, two-span steel truss
overall length 234 feet, gra
proaches, Hoosic river, North
Vt.; bids June 23, H. E. Sarge
missioner of highways, Mont

110 tons, building, for Times
Terminal Inc., New York.

Unstated, ten 133-foot steel tow
prefabricated steel frame b
bids in to Civil Aeronautics a
Washington.

# Reinforcin

**Reinforcing Bar Prices, Pag**

**Pittsburgh**—Reinforcing b
nages are coming out in g
ume and there is no appare
in sight. Placements are
slower but most current ton
for additions to projects
under way, with the lag b
inquiry and placement no
Speed of placement has
moved up in some sections b
weaknesses, notably in the

**Chicago** — Pending busine
tinues heavy, the largest
item being 3300 to 3800 ton
subway section to be bid J
Prospective orders include u
tonnages for several buildi
Northwestern university.
are headed by 1700 tons for
Ind., sewage disposal plant.

**Boston**—Reinforcing steel
has slackened, and inquiry
less active. Awards incluc
to 300 tons for highways in
Island and Connecticut is
bids on several contracts,
and roads, requiring close
tons.

**New York** — Reinforci
prices are slightly steadier ar
ing is less drastic. Buying

## Concrete Bars Compa

| | |
|---|---|
| **Week ended June 17** | |
| **Week ended June 10** | |
| **Week ended June 3** | |
| **This week, 1938** | |
| **Weekly average, year, 1938** | |
| **Weekly average, 1939** | |
| **Weekly average, May** | |
| **Total to date, 1938** | |
| **Total to date, 1939** | |

Includes awards of 100 tons o

also new inquiry although thousand tons of active untonnage pends.

**delphia**—Bids will be opened ) by the Pennsylvania turnmmission on the first paving t for its 150-mile program facing the superhighway bePittsburgh and Harrisburg. tial contract covers ten miles ll require 600 tons of reinsteel.

**le** — Recent awards have nills a fair backlog but no onnages are pending. The mportant project is tower ions for Bonneville authors at Portland, June 15, tonnstated. Mill prices are unand weak. Merchant bars o improvement.

**Francisco** — The only reinbar award of over 100 tons Ceco Steel Products Corp., s for a warehouse in San co for Best Foods Inc. totaled only 440 tons and the aggregate to date to tons, compared with 45,904 r the same period last year.

## rcing Steel Awards

s, sewage disposal plant, Gary, o Carnegie-Illinois Steel Corp., o.

, housing development (colored), ille, Ky., to Truscon Steel Co., stown, O.; Struck Construction ntractor.

s, Ballard bridge, Seattle, to vest Steel Rolling Mills, Seattle.

apartments, municipal housing ity, Yonkers, N. Y., to Bethleteel Co., Bethlehem, Pa.; Psaty rman, contractors.

viaduct, Brooklyn, N. Y., to hem Steel Co., Bethlehem, Pa.; ox Construction Co., New York, l contractor.

section 13B, Pennsylvania turnedford county, Pennsylvania, to hem Steel Co., Bethlehem, Pa.; Engineering & Construction Co., tor.

sewage disposal plant, Spring- Mass., to Bethlehem Steel Co., hem, Pa.; Caye Construction ntractor.

Ray's hill tunnel, Pennsylvania ce, to Jones & Laughlin Steel Pittsburgh; Mason & Hanger, tors.

two bridges in Fulton county, lvania, to Bethlehem Steel Co., hem, Pa.

additional award for power staswego, N. Y., by Central New ower Corp., to Truscon Steel Co., .

, elevator, Quaker Oats Co., O., to Joseph T. Ryerson & Son hicago; Alskog Co., contractor.

section 13C, Pennsylvania turnnake Spring township, Pennsylto Bethlehem Steel Co., Bethle- Pa.; York Engineering & Conon Co., contractor.

200 tons, paving, Shore and Southern parkways, Queens, N. Y., equally divided between Concrete Steel Co., New York, and Truscon Steel Co., Youngstown, O.; Garafano Construction Co., New York, general contractor.

200 tons, Nemours Foundation hospital, Wilmington, Del., to Republic Steel Corp., Cleveland; through Concrete Steel Co., George A. Fuller Co., contractor.

175 tons, Negley Run sewer, Pittsburgh, to Jones & Laughlin Steel Corp., Pittsburgh; Parkview Construction Co., Pittsburgh, contractor.

150 tons, Raccoon creek bridge, New Jersey, to Truscon Steel Co., Youngstown, O.; Francis A. Conuso & Sons, Philadelphia, general contractor.

135 tons, two bridges, Somerset county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

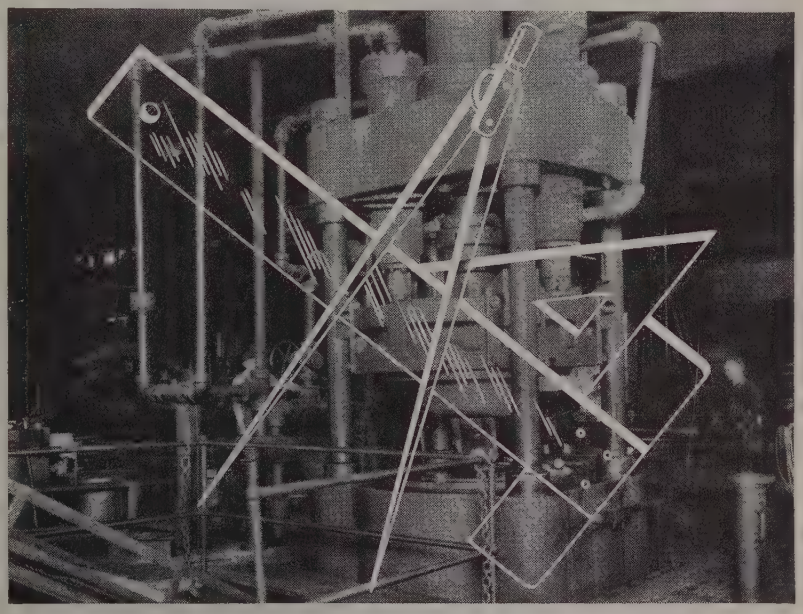
130 tons, warehouse, Best Foods Inc., San Francisco, to Ceco Steel Products Corp., San Francisco.

## Reinforcing Steel Pending

2100 tons, building, New England Mutual Life Insurance Co., Boston.

1485 tons, barracks, mess hall and galleys, naval air station, Alameda, Calif.; bids opened.

1100 tons, flood control dike, Holyoke,

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Many manufacturers have reduced costs, saved time and obtained increased efficiency by utilizing Hackney's unique designing, engineering and manufacturing facilities.

Special shapes and shells, produced by the Hackney method, are backed by more than 35 years of development and construction experience. The cold-drawing of seamless containers from numerous types of metal plates was pioneered by the Pressed Steel Tank Company. And Hackney welding is recognized as being superior. Hackney procedures permit the production of better, more dependable products at lower cost.

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1387 Vanderbilt Concourse Bldg., NEW YORK
1461 S. 66th Street, MILWAUKEE

**DEEP DRAWN SHELLS AND SHAPES**

Mass., Daniel O'Connell's Sons Co., Holyoke, general contractor.

1000 tons, plant extension, Washburn-Crosby Co., Buffalo; bids June 12.

775 tons, soap factory, Procter & Gamble Co., Quincy, Mass.

693 tons, western regional laboratory, Albany, Calif.; general contract to MacDonald & Kahn Inc., Financial Center building, San Francisco.

525 tons, highway projects, New York state; bids June 28, Albany.

500 tons, soy bean elevator, Glidden Co., Chicago.

250 tons, Four Mile run drainage basin, Pittsburgh; Mead Construction Co., contractors.

250 tons, approaches to Snohomish river bridge, Snohomish county, Washington; bids June 27.

225 tons, River front boulevard, contract 4, Pittsburgh.

200 tons, bridge and grade separation, Saginaw, Mich.

200 tons, public school No. 18, Buffalo, Metzger Construction Corp., Buffalo, low on general contract.

150 tons, foundations, fuel oil tanks, Bayone, N. J.; Graves & Quinn, New York, general contractors.

125 tons, state crossing, Tacoma, Wash.; bids to Olympia, June 27.

109 tons, paving and three bridges, Winchester, Conn.

100 tons, Washington state highway projects; Manson Construction Co., Seattle, general contractor.

100 tons, Fredonia state normal school, Fredonia, N. Y., J. M. Benzinger, Jamestown, N. Y., low on general contract.

Unstated, state spans at Bend and over Illinois river, Oregon; bids to highway commission, Portland, June 22.

## Ferroalloys

**Ferroalloy Prices, Page 84**

**New York** — Prices of ferromanganese and other leading ferroalloys have been reaffirmed for third quarter. Current marke the former of $80, Atlantic and ports, has prevailed since the m of January.

# Pig Iron

**Pig Iron Prices, Page 84**

**Cleveland**—Variations in deli so far this month compared May are small. Consumpti off slightly in some directions. plants are less active, but some ers of heating equipment co busy. Iron shipments to auto areas have been stimulated by ing of the Briggs strike. Price reported steady on new busine

**Chicago** — Shipments are sl now running behind May abo per cent. Declining require of automotive and agricultur terests are seen as chiefly re sible. A slight bulge in sale been noted since opening of for third quarter delivery at a tinued price of $21. Buying i spotty.

**Boston**—Demand is slightly ier, but the foundry melt sho tle gain. Only a small tonnag been booked for third quarte livery, and spot buying also is

**New York**—With a numb foundries planning vacation a ventory shutdowns July 1, pig is being bought sparingly. He equipment manufacturers are active in acquiring stocks o ished parts for the fall mark few export inquiries are pe largely for Scandinavian coun

**Philadelphia** — Pig iron spe tions are tapering as the inve and vacation season approach number of melters plan to clo July 4 week.

**Buffalo**—Shipments have ated slightly, following a smal up early this month. The s is attributed to no one in Melters are averaging three week, with iron purchases co only early needs. Eight of 1 furnaces are active.

**Cincinnati**—Shipments are to the May rate. Operations bing foundries are sustaine production of stove, auto parts and farm equipment c has receded. Most new pi business is in small lots for delivery, although sellers opened third quarter books changed prices.

**St. Louis** — Pig iron releas heaviest from jobbing found leases from farm implem stove plants being lighter. movement is off materially month ago. Little interest is

**INSURED** against Production Loss, too

"'Maxi' taps turned out to be real insurance against production loss," writes this Pennsylvania Manufacturer.

"We were tapping seamless steel tubing. Our best previous record was 80 holes per tap. With a 'Maxi' tap we threaded 1200 holes, and as far as we could see the tap showed absolutely no signs of wear."

"Maxi" taps insure against loss on tool costs and production time. Their special surface treatment has been developed by *"Greenfield"* to meet modern requirements. Identify them by their jet black finish.

**GREENFIELD TAP & DIE CORPORATION, GREENFIELD, MASSACHUSETTS**
Detroit Plant: 2102 West Fort St.—Warehouses in New York, Chicago, Los Angeles and San Francisco.
In Canada: Greenfield Tap & Die Corporation of Canada, Ltd., Galt, Ontario

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"GREENFIELD" SOLD BY DISTRIBUTORS EVERYWHERE
TAPS
DIES · DRILLS
SCREW PLATES
PIPE TOOLS
REAMERS
GAGES

tracting, new business being
t to spot orders.
**ingham, Ala.**—Thirteen blast
es are producing. These in-
seven for the Tennessee com-
and two each for Sloss, Re-
and Woodward, unchanged
ast week.
**nto, Ont.**—Sales are steady
re coming principally from
r consumers. Most of the
melters are covered for the
t. Consumption and produc-
e unchanged.

## rap

Scrap Prices, Page 86

**burgh**—Scrap prices continue
vith little No. 1 steel available
mand relatively light. Orders
ppeared from several points,
ere is no undue pressure for
y. While scrap is coming out
y, brokers are covering on
margin in some cases.
**eland**—Little scrap is moving
any grades are scarce. Since
es are being shipped outside
tracts but little buying is be-
ne. Prices on some special-
ave been advanced 25 to 50
particularly cast grades.
**ago** — No. 1 heavy melting
s off 25 cents, with several
grades also moderately lower.
is coming out more freely
month ago, with No. 1 steel
d offered by dealers as low

**on** — Domestic prices are
machine turnings and
d skeleton being slightly
while breakable cast is easier.
**York**—Buying for export is
but not above the normal
t unchanged prices. Domestic
is light, eastern mills taking
ed small shipments and in
instances shipments are held
omparatively little tonnage is
from New York to eastern
lvania. Foundry grades are
Domestic prices are un-
d, undoubtedly maintained in
y export quotations.
pean cartel has bought addi-
scrap, including steel and cast
. Negotiations continue for
r tonnage which may come
to 600,000 tons. This follows
se of about 350,000 tons two
s ago. Prices paid are said to
for No. 1 and $13.50 for No.
same as on the last sale.
**adelphia** — Prices continue
due to export activity. Do-
consumers show little inter-
the market. Heavy breakable
easier, but certain special-
re higher. Scrap exports,
fell markedly in May, are ex-
pected to rebound to the April level this month.

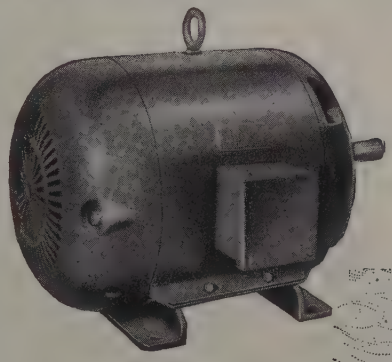
**Buffalo**—Mills are resisting higher scrap prices and are curtailing receipts against old orders, but dealers continue bullish. Sentiment is bolstered largely by higher prices in other districts. Steelworks report ample supplies on hand for early needs.

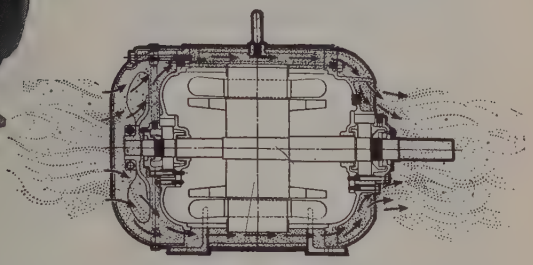
**Detroit**—Scrap has advanced 50 to 75 cents a ton, largely in sympathy with the trend in other districts. Scrap is coming out slowly, but major consumers are comfortably supplied for the next 60 days, if not longer. Brokers are somewhat disinclined to share the optimism of dealers.

**Cincinnati** — Prices are up 50 cents, although market activity has increased only moderately. Scrap movement is heavier, reflecting recent improvement in steelmaking. Demand for foundry grades is unchanged, but prices on all items have advanced.

**St. Louis** — Sale of several thousand tons of heavy melting steel to an east side mill is the only out-

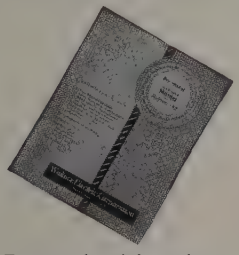

# Wagner CP Motors are Protected





**Motor Maintenance is reduced to a minimum where Wagner type CP totally-enclosed fan-cooled motors are used, because Wagner CP motors are protected against the entrance of dust, filings, fumes, moisture, and other agents that are destructive to open-type motors.**

## Ask for this Valuable Bulletin



For complete information on Wagner type CP motors write for Bulletin 182. If you have anything to do with the selection, operation, or maintenance of motors, you should have a copy of this valuable bulletin. It's free—no obligations.

The use of open-type motors in dust-laden atmospheres means frequent shut-downs for cleaning and repairing. Shut-downs are costly—in two ways. Not only the actual cost of motor maintenance, but also the loss of production time must be considered.

The reason why Wagner CP motors can operate continuously under conditions which cause trouble with open-type motors is that they are built with two frames, an outer frame which guides a strong cooling draft over the motor, and an inner frame which completely seals the vital parts of the motor against the entrance of destructive agents.

Protect yourself against excessive motor maintenance and unnecessary shut-downs by standardizing on Wagner type CP motors.

M39-16

**Wagner Electric Corporation**

6400 Plymouth Avenue, Saint Louis, U.S.A.

MOTORS TRANSFORMERS FANS BRAKES

standing transaction in the market. The material brought $11.50, unchanged from the last purchase by this interest. Mills generally are well supplied. Offerings continue moderate.

**Birmingham, Ala.**—Scrap is quiet, both sales and inquiries being scarce.

**Seattle**—Mill buying is fair, $12 and $11 being paid for No. 1 and No. 2, respectively. The export market is quiet, Japan placing small orders. In spite of small demand from the Orient, local export prices continue firm at $14 and $14.50. Tidewater stocks are generally low, receipts from the interior being under normal levels.

**Toronto, Ont.**—Most scrap prices are firm, and a reflection of the higher market in the United States is looked for here, but stove plate is off another $1 a ton. Machinery cast is more active, but steelmaking grades are quiet in new business. A local pipe foundry which recently resumed operations is in the market for cast scrap.

# Warehouse

**Warehouse Prices, Page 85**

**Cleveland**—Most warehouses note little change in sales since a month ago. Some machinery builders are more active, this being reflected in better bar demand lately.

**Chicago** — Sales were up slightly last week and also somewhat heavier than a month ago. Some seasonal slowing down is expected near the end of June, but absence of a major letdown at this time is encouraging to warehouses.

**Boston**—Volume is close to the May rate, recent price revisions having stimulated demand for some products. Heavy items are relatively slow.

**New York** — Warehouse demand has slackened slightly. Orders continue numerous, but tonnage is down. Specialties make relatively the best showing. Recently adjusted prices are generally maintained except for usual scattered shading.

**Buffalo**—Business is steady or a trifle better compared with a month ago. Demand is well diversified. Prices are steadier.

**Cincinnati** — Sales are well sustained. Resumption of coal mining has aided demand, but inquiries for building materials are disappointing.

**St. Louis** — Business is slightly heavier. Small shapes and tubular products for building work are more active and rural demand is slightly heavier.

**Seattle** — Volume is about the same as a month ago but the market is developing signs of se lethargy. Prices continue un Portland dealers are generally taining their price lists.

# Steel in Europ

**Foreign Steel Prices, Page 8**

**London** — (*By Cable*) — M brough pig iron market is but many contracts are booked to the end of the Foundry iron sales in Grea ain continue dull. Steel pro and rerollers continue to oper capacity. American scrap an tinental and Australian semifi steel are relieving the situati

Steel ingot and castings p tion in May was 1,218,100 gros an alltime record, compared 1,058,200 tons in April. Pi production in May was 692,10 compared with 608,900 tons in

British foreign trade inc sharply in May, imports t 142,612 gross tons, a gain of tons over 91,634 tons in April of the increase may be attrib increased tonnage of semif steel from the Continent an vanized sheets from Americ other sources. Exports an to 168,513, an increase of 22,4 over 146,056 tons in April.

The Continent reports expor is active, with indications go large British orders for semif steel. Holland and Scandina buying ship plates.

# Iron Ore

**Iron Ore Prices, Page 86**

**New York**—Chinese wol is easier on recent offerings as $17.50 to $18 per short to duty paid. Demand is light. ness is attributed to tempora drawal of Germany and from the market, following stocking. Domestic scheeli ever, is relatively steadier standing in an otherwise s market is the sale here o 8000 tons of North Afric phosphorus iron ore. Price revealed, but the market g has been around 12 cents p Imported fluorspar is ea $21.50 for 85-5 material, a of 50 cents.

## Coke Oven By-Produc

**Coke By-Product Prices, Pa**

**New York**—Distillate pri unchanged with current production moving directly i sumption, supplies of benz taken by the chemical rubb

nsumers in steady volume. varnish and lacquer users ab- good part of toluol and xylol ion. Phenol buying is steady ices unchanged. Naphthalene has declined, notably with , the household season hav- ded. Announcement is ex- late this month on next sea- sulphate of ammonia con-

## rrous Metals

York—Heightened tension in r East and Central Europe ek threw a bearish note into nferrous metal markets. Sales ipments held at fairly good ut expected increases failed erialize as the trade stood ending developments.

er—Recovery of export prices n the week was offset near se with foreign buyers gen- marking time. Domestic s also declined and the price ctroiytic copper held un- d at 10.00c, Connecticut. Nev- ss, leaders in the industry for gradual improvement e next few months.

—Sales of domestic lead re- t the level of about 10,000 eekly despite price fluctua- London. An advance of $1 was made at midweek by domestic sellers, bringing here to 4.80c, New York, and t. Louis. Buying was stimu- ly slightly by the advance.

—Continued decline of the zing rate was not reflected in ek's zinc sales, but other fac- hiefly seasonal, brought the e to about half the previous total. Prime western zinc ithout change at 4.50c, East is, the price at which it has nce Nov. 29, 1938.

-Political and military devel- s in South China were re- in the trade as a strengthen- her than a weakening factor Increase in the third quar- ort quota to 45 per cent of d tonnages, made by the In- nal Tin committee last week, ntly was discounted in ad- pricewise.

## Imports Steady

more — Five shipments of e arrived here from May 24 e 3. These were 21,800 tons Cruz Grande, Chile, May 27; tons, Cruz Grande, Chile, ); 7741 tons, Narvik, Sweden, .; 22,500 tons, Cruz Grande, June 2; and 10,500 tons, ri, June 3.

# Nonferrous Metal Prices

*Spot unless otherwise specified. Cents per pound.*

| June | Copper Electro, del. Conn. | Copper Lake, del. Midwest | Copper Casting, refinery | Straits Tin, New York Spot | Straits Tin, New York Futures | Lead N. Y. | Lead East St. L. | Zinc St. L. | Aluminum 99% | Antimony Amer. Spot, N.Y. | Nickel Cathodes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 10.00 | 10.00 | 9.62½ | 48.35 | 48.05 | 4.75 | 4.60 | 4.50 | 20.00 | 12.00 | 35.00 |
| 12 | 10.00 | 10.00 | 9.62½ | 48.25 | 48.00 | 4.75 | 4.60 | 4.50 | 20.00 | 12.00 | 35.00 |
| 13 | 10.00 | 10.00 | 9.62½ | 48.35 | 48.15 | 4.75 | 4.60 | 4.50 | 20.00 | 12.00 | 35.00 |
| 14 | 10.00 | 10.00 | 9.62½ | 48.75 | 48.55 | 4.80 | 4.65 | 4.50 | 20.00 | 12.00 | 35.00 |
| 15 | 10.00 | 10.00 | 9.62½ | 48.75 | 48.55 | 4.80 | 4.65 | 4.50 | 20.00 | 12.00 | 35.00 |
| 16 | 10.00 | 10.00 | 9.62½ | 48.75 | 48.55 | 4.80 | 4.65 | 4.50 | 20.00 | 12.00 | 35.00 |

**MILL PRODUCTS**

*F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 10.00c Conn. copper*

**Sheets**

Yellow brass (high) .....16.48
Copper, hot rolled .....18.12
Lead, cut to jobbers .....8.00
Zinc, 100 lb. base .....9.75

**Tubes**

High yellow brass .....19.23
Seamless copper .....18.62

**Rods**

High yellow brass .....11.85
Copper, hot rolled .....14.62

**Anodes**

Copper, untrimmed .....15.37

**Wire**

Yellow brass (high) .....16.73

**OLD METALS**

*Nom. Del. Buying Prices*

**No. 1 Composition Red Brass**

New York .....5.75-6.00
Cleveland .....6.50-6.75
Chicago .....5.75-6.00
St. Louis .....6.00-6.25

**Heavy Copper and Wire**

New York, No. 1 .....7.75-7.87½
Cleveland, No. 1 .....7.50-7.75
Chicago, No. 1 .....7.37½-7.62½
St. Louis .....7.50-7.75

**Composition Brass Borings**

New York .....5.00-5.25

**Light Copper**

New York .....6.25-6.50
Cleveland .....5.75-6.00
Chicago .....5.75-6.00
St. Louis .....6.00-6.25

**Light Brass**

Cleveland .....3.50-3.75
Chicago .....3.87½-4.12½
St. Louis .....3.50-3.75

**Lead**

New York .....4.00-4.25
Cleveland .....3.50-3.75
Chicago .....3.50-3.75
St. Louis .....3.50-3.75

**Zinc**

New York .....2.50-2.62½
Cleveland .....2.00-2.25
St. Louis .....2.25-2.50

**Aluminum**

Borings, Cleveland .....5.75-6.00
Mixed, cast, Cleveland .....7.75-8.00
Clips, soft, Cleveland .....13.75-14.00
Misc. cast, St. Louis .....7.00-7.25

**SECONDARY METALS**

Brass ingot, 85-5-5-5, less carloads..10.25
Standard No. 12 aluminum....12.00-12.25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## May Ore Imports Off

**Baltimore**—Iron ore importations here in May aggregated 178,476 tons, against 184,670 tons in April and 141,349 tons a year ago. May imports bring the total for the first five months up to 915,085 tons, with March the outstanding month so far, with a total of 199,088 tons. For first five months last year iron ore arrivals totaled 763,484 tons.

Manganese ore importations in May of 39,860 tons were the largest to date, surpassing slightly the 39,270 tons brought in in January. It compared with 20,161 tons in April and 24,380 tons a year ago and brought the total for the first five months up to 131,204 tons, against 196,223 tons in the corresponding period last year.

Chrome ore importations in May also exceeded arrivals in any preceding month, totaling 9418 as against 6880 tons in April, the second highest total, and 5800 t January, the third highest. I 1938, 14,259 tons were receive rivals for the first five mont taled 25,708 tons, against tons in the same period last

Ferromanganese shipments month totaled 924 tons plu barrels. Pyritis importations 20,933 tons, against 13,193 t the preceding month, 13,0 March, 14,826 in February an in January. Magnesite ship comprised 5368 tons plus 20 Eighty-six tons of kyamite or came in.

**Philadelphia**—Shipments re here during the week ending 10 included 6012 tons of chron from Cuba, 548 tons of pi from the Netherlands and 2 of wire rods and five tons o billets from Sweden.


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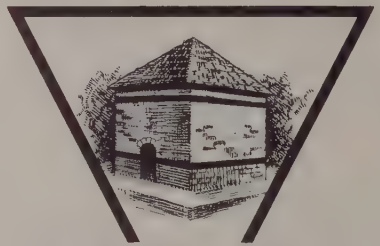

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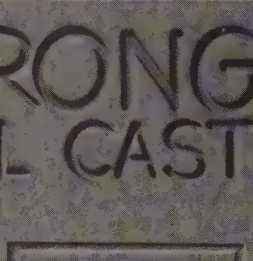

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# Equipment

**New York**—Purchases of m tools by domestic users ar maintained with slight gains ed by some dealers. Anoth for export is expected out for Russia. Orders are still f or two tools at a time, but th of business is well distribut dustrial activity being confi most entirely to replacement ditional purchases by at lea shipyard in the East are ex Most builders have substantia logs, reflected in deliveries u weeks in some lines. Jun ments will probably top May

**Chicago**—One leading mac interest reports bookings 20 p ahead of same period in Ma mand from Detroit district ticularly improved. Some buying is evident, although purchasing covers a broad ra interests. Dark spot in pres ture is a slowing up of active ies. Machinery interests June will turn out better tha unless the last week or ten the month bog down more t pected.

**Seattle**—Important season tings have been made and d for machinery and equipme eased. Federal and municip quirements are heavier th mand from industrial sources replacements are confined mediate needs. Jenkins Bros., port, Conn. are low at $8557 ver for furnishing by-pass piping for the Coulee pumpin and Hardesty Mfg. Co., Den low at $11,880 for furnishin fittings and appurtenances same project.

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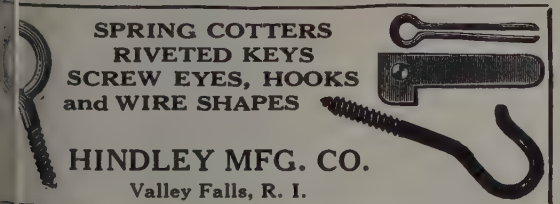

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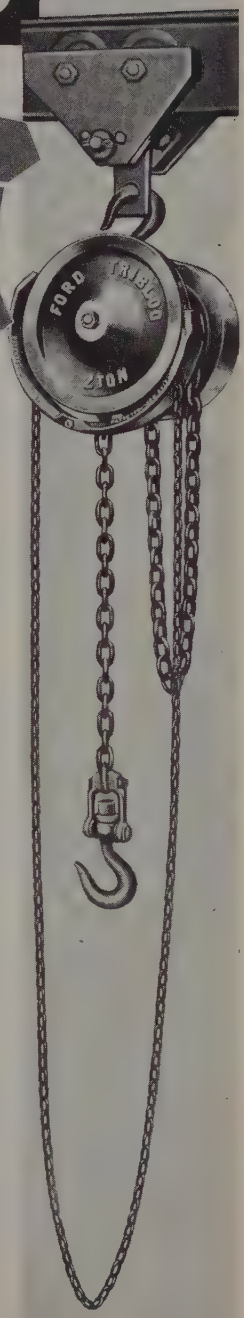


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# Construction and Enterprise

### Ohio

BRYAN, O.—Village, C. F. Hester, clerk, will probably issue mortgage bonds to finance purchase of a 3000-horsepower diesel engine and appurtenances costing about $150,000 for installation in its power plant. Will mature in fall. (Noted May 29.)

MANSFIELD, O.—Tappan Stove Co. plans to erect a complete enameling plant, one-story, costing $100,000 with equipment.

MIDDLETOWN, O. — City, Walter Braun, manager, has authorized purchase of a site for its projected new municipal light and power plant to cost $2,466,000. Consulting engineer, Froehlich & Emery Engineering Co., Toledo, O.

SOUTH BOULEVARDS, O.—Village, Dr. C. W. Frickman, mayor, is starting survey and will apply to WPA for aid in projected construction of a sewerage system and sewage treatment plant costing about $75,000. North-Central Ohio Engineering Co., Mansfield, O., consultant.

WEST MILTON, O.—Village, Marshall Walker, mayor, will vote July 14 on proposal to issue bonds to finance waterworks improvements costing $30,000. Includes 100,000-gallon storage tank,


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WILLARD, O.—Village, Ernest mayor, is taking bids due at noo 24, on installing a new 1500-k steam turbine generating unit c with appurtenances, and a new condenser. Total cost is not to $87,000. F. N. Straus, Clevelan sultant. (Noted May 15.)

### Connecticut

STAMFORD, CONN.—City is c ing plans for a sewerage syste pumping station costing approx $245,000. L. E. Tuttle, city engine

### New York

BINGHAMTON, N. Y.—City is ing bids on contract 5 for improv to its filter plant at estimated $110,000. Part of WPA project.

BUFFALO—Worthington Pump chinery Corp. has awarded to Stimm Inc., Ellicott Square b Buffalo, a contract for buildin x 176-foot addition to its plant.

BUFFALO—Fisher Body divis General Motors Corp., Detroit, is ing plans for an addition to its bly plant here.

OSWEGO, N. Y.—Texas Petrole New York, will soon take bid laboratory estimated to cost $ Ballinger Co., Philadelphia, engin

### Pennsylvania

CHESTER, PA.—Scott Paper C ward S. Wagner, treasurer, has ground for the first unit in a $1 plant expansion program. Pro cludes a new papermaking machi auxiliaries and finishing equipme

NORTH GIRARD, PA.—Boro ha for sewers and sewage disposal including tanks, pumps and filt total cost of $208,600. To matur Hill & Hill, North Girard, consult gineers.

### Michigan

JACKSON, MICH. — State, Gr Dillman, budget director, Lansing is receiving bids until 2 p. m., J for power plant equipment to stalled in the state prison her volves coal burners and related equipment, boiler feed pump, wat ener and aerating tower, and force fan. Cummins & Barnard, Ann Mich., consultants.

### Illinois

CHICAGO—National Aluminat is asking bids for a one-story, 107 foot factory addition costing $40,

CHICAGO—Chicago Metallic M has awarded contract to Heidel 6235 South Michigan avenue, for dition to its factory at cost of (Noted May 1.)

CHICAGO—Shannon Steel Co 4034 South Princeton avenue, ha organized by L. V. Shannon, Crawford and H. M. Crawford wi shares $5-par stock to deal i steel, tin and other metals.

CHICAGO HEIGHTS, ILL.—A Manganese Steel Co. has let a c to Campbell, Lowrie & Lautermil West Madison street, Chicago, foundry addition costing $50,000. May 29.)

NORTH CHICAGO, ILL.—Abbo oratories soon will take bids on story machine shop costing about Battey & Childs, North Chicago tects.

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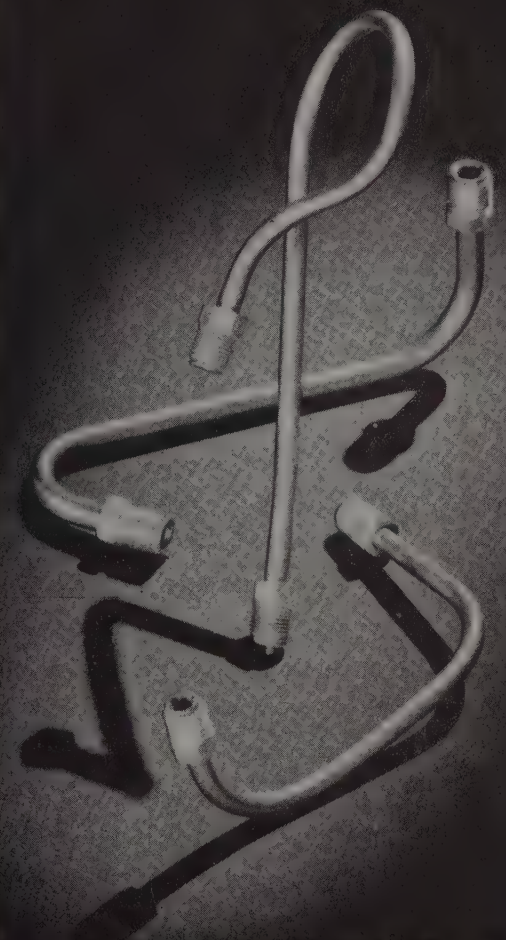

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### Minnesota

HALSTAD, MINN.—Red River Valley Power co-operative. George Henderson, secretary, is considering construction of about 130 miles additional electric transmission lines. C. J. Halstad, Halstad, project engineer.

IRONTON, MINN.—Village, E. J. Taleen, clerk, will hold election soon on proposal to issue bonds to finance a water filtration plant at cost of about $15,000.

MINNEAPOLIS—Lewis Bolt & Nut Co., F. T. Robertson, vice president, has awarded contracts for a two-story galvanizing plant estimated to cost about $75,000.

### Texas

GARLAND, TEX.—Town, J. R. Stultz, representative, has voted bond issue and will make improvements in its water system at cost of $22,000. New pumping equipment is to be installed.

KENEDY, TEX.—Town is making plans to construct a municipal electric distribution system at cost of approximately $100,000.

LITTLEFIELD, TEX.—Lamb County Electric Co-operative Inc. proposes to construct 87 miles of rural electric power transmission lines in two counties at cost of $64,000. H. N. Roberts, Lubbock, Tex., consulting engineer.

McALLEN, TEX.—Central Power & Light Co., Corpus Christi, Tex., is now taking bids for a new pump room and filter bed in its plant.

### Kansas

BELLEVILLE, KANS.—NCKRE association will start plans soon for constructing 355 miles of rural electric transmission lines in two counties. Paulette & Wilson, Salina, Kans., consultants.

SENECA, KANS. — Marshall-Nemeha Rural Electrification Service Inc. is preparing to build about 375 miles of rural transmission lines through two counties. Paulette & Wilson, Salina, Kans., consulting engineers.

### South Dakota

ALCESTER, S. DAK.—City has started preliminary plans for a sewer system and sewage treatment plant.

WALL, S. DAK. — Wall Commercial club, R. F. Lewis, president, has applied to REA for a $115,000 loan to finance projected construction of 114 miles of rural transmission lines serving 528 consumers.

### Iowa

ALDEN, IOWA—Village, C. F. Bigelow, clerk, is considering construction of a complete water softening plant in connection with its water distribution system.

PERRY, IOWA—Osmundson Spade Co. is rebuilding its spade factory, destroyed recently by fire. Total cost estimated at $75,000.

### Colorado

DENVER—Reclamation bureau asks bids until July 10 for two 350-ton trolley motor-operated overhead cranes for Grand Coulee power plant at Odair, Wash. Specification 851.

### Pacific Coast

BELL, CALIF.—Certificate to conduct business under the firm name of Bell Metal Products, 3605 Gage avenue, has been issued to owner, Walter Nettleship.

LOS ANGELES, CALIF.—Certificate to conduct business under name of Hard Chrome Engineering Co., 1051 East Slauson avenue, has been issued to owners Harris Pierce, Joseph Murray and Charles Turner.

PORTLAND, OREG.—Schmitt Steel Co. has acquired land adjoining its plant and plans to build an addition and install new equipment.

### Canada

COBOURG, ONT.—Municipality, W. G. Henderson, manager, plans to sewage treatment plant estima cost $25,000. Public utilities con engineers in charge.

HUMBERSTONE, ONT.—Inter Milling Co. Inc., Minneapolis, p to construct a milling plant at $75,000. R. J. Bodman, care of engineer.

HUMBERSTONE, ONT. — L Foundry Co. Ltd., Port Colborne has plans underway for remodel plant and installing new equipm total cost of $40,000.

PORT ARTHUR, ONT.—Canad soting Co. is drawing plans for factory costing $200,000 includin age tank and tar products distill


NF

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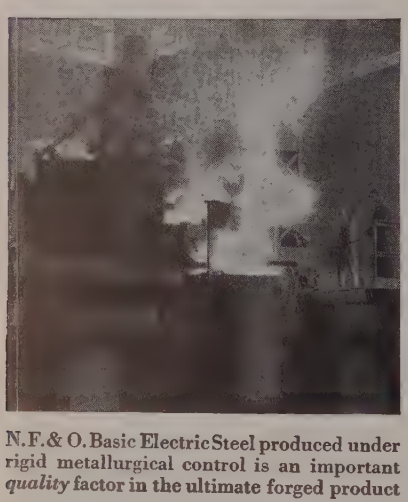

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# ADVERTISING INDEX

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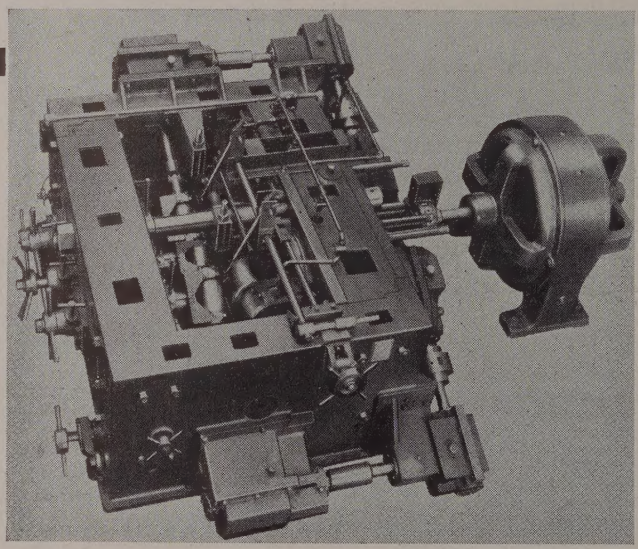

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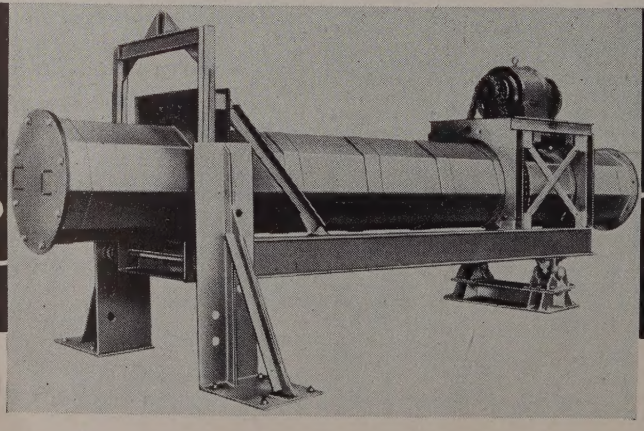

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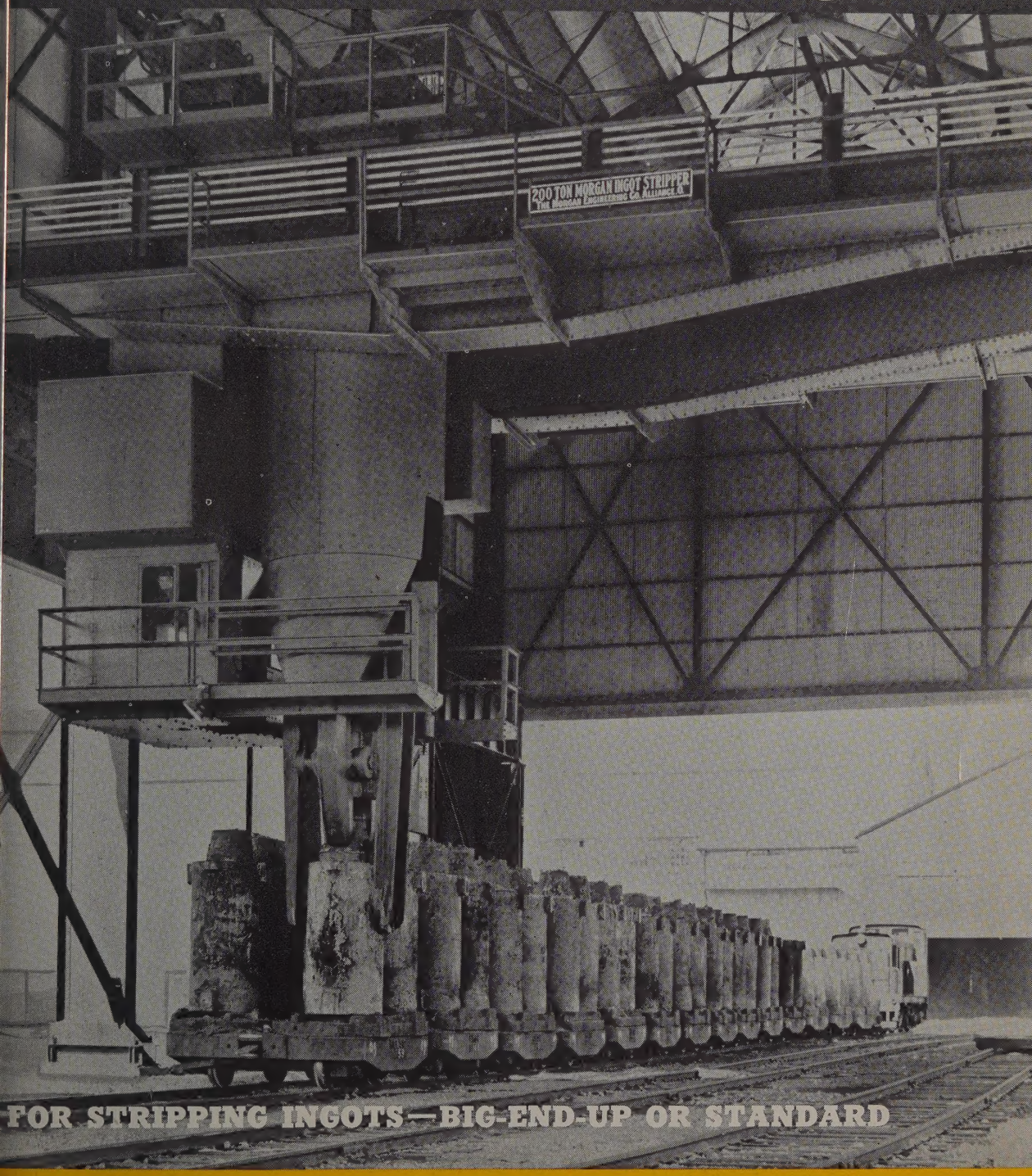


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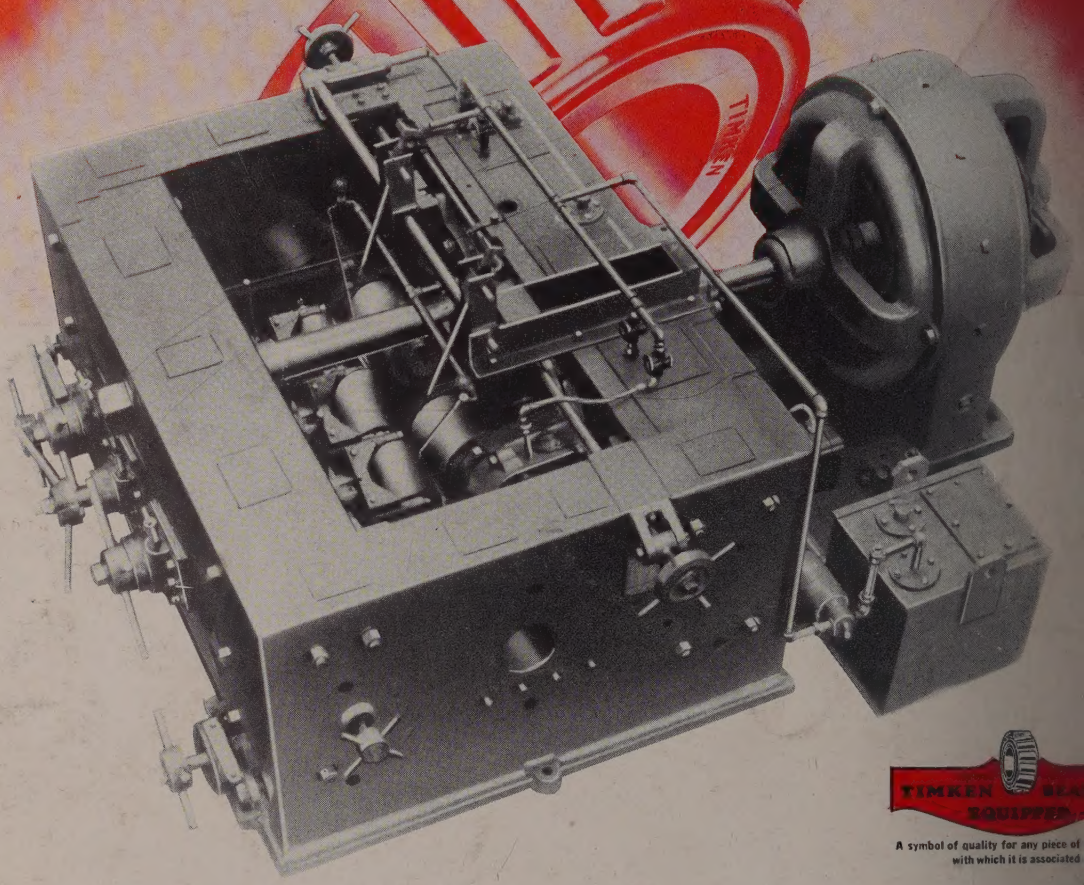

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